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As prevention of disease is better than its cures, and prevention of war is usually better than victory, so prevention of accidents is better than attempted compensation for them . . . Teaching the world to be careful is a constructive service worthy of God's great gift to man.

—Harold H. Burton, Retired Justice of the Supreme Court of the United States

In This Issue

APPROACH

The Naval Aviation Safety Review

Published by U. S. Naval Aviation Safety Center
NAS, Norfolk 11, Va.
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Commander

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Letters

Undated Quotes

Sir:

The Safety Council quotation (Shorter Life) p. 22, Jan 1960 APPROACH caused some mild repercussions in the NAS Pensacola O&R Department, mainly because the quotation is no longer valid . . . it was taken from the minutes of the February 1959 CNABaTra Aviation Safety Council.

Suggest that future quotations of this nature give the date of the Safety Council meeting. The words "present" and "within the next year" were contained in the quoted part. It made it appear that "present" referred to January 1960 and that "within the next year" referred to the period ending with January 1961.

NAS Pensacola O&R is quite proud of the progress which has been made during the past year in improving T-28 engine reliability . . . the quotation made them ask "who said that?"

C. E. FANNING, CDR
Aviation Safety Officer

NAS Pensacola, Florida

● **Will do.**

'The Longest Daybreak'

Sir:

I have just finished reading "The Longest Daybreak" Jan 1960 APPROACH. Re the statement "Pilots who wear flashlights on lanyards around their necks take a chance on the cord hanging up on something during ejection and possibly injuring or strangling them."

This possibility was pointed out to me once before. So I stopped wearing the flashlight around my neck, despite the fact that it was most inconvenient to grope for it around the cockpit when it was needed, which is fairly often.

I have gone back to wearing the flashlight around the neck after the following incident, which occurred during a night CCA recovery with a wingman in (A4Ds). It was a very black night with a broken stratus layer at 1500 feet. Just before leveling off from the 4000 fpm descent from marshall I glanced back to check my wingman. When my eyes swung back to the instruments the altimeter dial was black—the light had gone out. I groped for the flashlight in the map case (you have to reach around the g-suit and oxygen hoses in the A4D). By the time I got it out the level-off had been completed on the remaining instruments. Then by the light the altimeter was brought back into view.

The point is: if the flashlight had been in its old familiar place dangling from a cord around my neck there would have been no delay in illuminating the altimeter. I have often wondered how smoothly I could have leveled off if all the instrument lights had gone out.

So, I now wear the flashlight as before with one exception. For a lanyard I use a length of 1" cloth tape. The ends of the tape are *stapled* together with one of those little stapling machines. I use three staples and find that this arrangement is sufficiently strong to keep the loop intact under the weight of the flashlight but parts easily with a slight tug. This, I believe, eliminates the danger of the cord hanging up during ejection and restores the flashlight to the best location for routine and emergency use.

L. T. PROFILET, LT.

Monterey, Calif.

Pro Code

Sir:

"Approach To The Professional" in the Jan. 1960 APPROACH is one of the most profound articles about being a professional that I have ever read. Commander Rose put into thought-provoking words what we have been discussing periodically in meetings of the pilots of VA-144. The "Code of Conduct for Professionals" crystallized all of the subjects that we have talked about, and around, during such meetings.

I believe that a truly professional approach to flying would eliminate a large percentage of pilot caused accidents. Therefore, may I suggest that a poster of the "Code of Conduct for Professionals" be prepared by the Safety Center and distributed to all aviation commands. The posters would serve to remind us periodically of what we *should* be doing because, as humans, we unfortunately tend to stray from the correct path. Each squadron could use at least two posters: one for the Readyroom, and one for the Line Shack.

ROBERT R. KING, JR., LCDR

Operations Officer, VA-144

VOLUME 5 APPROACH—THE NAVAL AVIATION SAFETY REVIEW NUMBER 10

Purposes and Policies: APPROACH is published monthly by the U.S. Naval Aviation Safety Center and is distributed to naval aeronautical organizations on the basis of 1 copy per 12 persons. It presents the most accurate information currently available on the subject of aviation accident prevention. Contents should not be construed as regulations, orders, or directives. Material extracted from Aircraft Accident Reports (OpNavs 3750-1 and 3750-10), Medical Officer's Reports (OpNav 3750-8) and Anymouse (anonymous) Reports may not be construed as incriminating under Art. 31, UCMJ. Photos: Official Navy or as credited.

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Correspondence: Contributions are welcome as are comments and criticisms. Views expressed in guest-written articles are not necessarily those of NASC. Requests for distribution changes should be directed to NASC, NAS Norfolk 11, Va., Att: Literature Dep't.

Printing: Printing of this publication approved by the Director of the Bureau of the Budget, 21 Dec 1957.

Subscriptions: Single copy 20 cents; 1-year subscription $2.25; 75 cents additional for foreign mailing. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Library of Congress Catalog No. 57-60022.

SPECIAL D

by
LT Alan L. Bean

My A4D was running fine until I pulled up on the fourth loft run. I felt a vibration and heard a rumble. Smoke started oozing out between the rudder pedals and my feet were getting hot.

"The oil pressure showed OUT so I pulled back to idle and dropped the air-driven generator. I figured I was inverted and tried to recover. The controls didn't do any good. Dirt which is supposed to lie quietly on the deck was wandering by my face. When the altimeter read 8000 feet, I pulled the handle and got out okay."

This pilot applied emergency procedures and quickly. They just didn't happen to fit the emergency he was in. Outside observers saw the aircraft continue straight up and enter a spin.

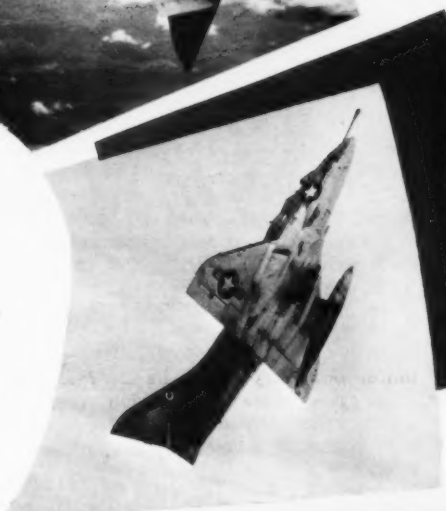
Airplane Handling Characteristics

The A4D-1 and A4D-2 have no adverse handling characteristics during the loft maneuver. At normal gross weights 4-G can be maintained during the half Cuban-eight maneuver until the aircraft has rotated approximately 110 degrees, and at this time a slight airframe buffet will be encountered. The pilot should fly the aircraft at buffet boundary until the nose is approximately 30 degrees below the horizon where he rolls upright and continues in a 30-degree glide down to escape altitude.

If the pilot attempts to maintain 4-G too long and the airplane is pulled too deeply into the buffet zone, one wing slat may extend abruptly and cause the airplane to roll as much as 30 degrees before the pilot can react. Since ailerons remain effective, the airplane can be easily controlled and returned to the original flight path by a coordinated turn; however, under instrument flight condition

L DELIVERY

Near maximum speed, low level, acrobatic maneuvers require that the pilot be aware of special techniques and precautions peculiar to this method of weapons delivery.



this abrupt roll could prove confusing.

If it is necessary to perform loft maneuvers at high gross weights there will be a deterioration of handling characteristics. Buffet will be encountered earlier on the profile, the indicated airspeed on top will be reduced as much as 40 knots, and the tendency of the slats to extend asymmetrically is more pronounced. Loft bombing can be performed safely at these high gross weights, but precise pilot technique is required.

With the fully powered longitudinal control system in the A4D-2, the airplane is especially sensitive to longitudinal stick forces at high speed and low altitude. Because of this sensitivity the run-in on initial flights should be performed at altitudes higher than the 100 feet recommended. The pilot can reduce the altitude for run-in to 100 feet without difficulty as his experience increases; however, he should not reduce this altitude at a rate which will cause him to feel uncomfortable, and in no case reduce it below the 100 feet recommended. This altitude cannot be determined by reference to the altimeter due to its inherent errors but must be estimated from pilot experience. A little excess nose-up trim during the run-in may help should the pilot fail to monitor his altitude as closely as necessary.

Training Shapes

When the loft maneuver is performed with a training shape or weapon aboard, the added weight below the aircraft will act as a pendulum. The pendulum effect will steady the aircraft in roll during the maneuver. The release of the shape is accompanied by a momentary 1.0 to 1.5 g increase.

This g-jump does not cause any adverse handling characteristics but when release occurs under instrument conditions, an inexperienced pilot may become momentarily disoriented.

It is recommended that each pilot release at least one training shape under visual conditions before attempting a release in the clouds.

Instrument Recoveries

VX-5 points out that in the A4D the ability of the pilot to perform recoveries from the loft maneuver during instrument conditions is limited by the lack of an accurate instrument to indicate all attitudes of the aircraft.

The LABS indicator was not designed as a primary flight instrument and can be misinterpreted after weapon release, especially during recovery from inverted flight. The gyro horizon precesses excessively during loft maneuvers and wing indication may be as much as 30 degrees in error.

Later A4D-2s and all A4D-2Ns are expected to have a more reliable attitude indicating system. However, pilots with high levels of proficiency and experience can safely complete instrument recoveries subject to several limitations.

When the clouds are such that the pilot recovers from inverted flight on instruments, the ceiling should be high enough to permit corrections to the attitude of the airplane safely after visual contact with the ground or horizon is re-established. The minimum recommended ceiling in this case is 5000 feet. If a layer of clouds exists so that a recovery from inverted flight can be completed prior to re-entering the clouds, the ceiling requirements may be lowered to 3500 feet or even lower depending on the individual pilot.

The wingover recovery used with low release angles should not be attempted if any part of recovery is in the clouds. The requirements of high load factor and bank angle close to the ground make the escape turn extremely hazardous even with excellent cockpit instrumentation. The minimum suggested ceiling for the wingover maneuver is 2000 feet.

Once the pilot has become familiar with the proper half-Cuban eight recovery technique under VFR conditions he should then make all of his recoveries with reference to his instruments. With the rapidly moving cumulus cloud cover that is found over many targets during the summer months the pilot may, on any run, be required to release and recover in the clouds.

When release does occur under instrument conditions, the pilot should keep the bomb pickle depressed and continue to fly the LABS indicator for at least two seconds following the high-angle release before shifting to primary flight instru-

Lieutenant Alan L. Bean, who prepared this article while he was with VA-44, is now at the U. S. Naval Test Pilots School, Naval Air Test Center, Patuxent River, Maryland. Designated a Naval Aviator in mid-1956, he received training at the Fleet Air Gunnery Training Unit. Following graduation he became a delivery instructor and a mobile weapons team member. LT Bean holds a degree in Aeronautical Engineering from the University of Texas.

Painting by R. G. Smith, Courtesy Douglas Aircraft Co.

ments; for lower release-angles the pilot should continue flying the LABS indicator until passing the vertical position. This position can be estimated both from experience and by noting the gyro horizon going through gimbal lock and flipping at the 90-degree point. Gimbal lock is easily seen even though the pilot's primary attention is focused on the LABS indicator.

If a training shape is being released the pilot must be alert to the effects of g-jump in order to reduce the possibility of disorientation or confusion immediately following release of the weapon. In the event of LABS failure the pilot can safely complete the maneuver by reference to his primary flight instruments.

Pattern Procedures

The loft pattern is similar to other bombing patterns with two major exceptions. They are: one, the pattern is flown close to the deck; and two, each airplane flys in the near vicinity to the bomb trajectory of the airplane ahead of it. High-speed low-level flight requires constant pilot attention to maintain proper ground clearance and to perform necessary cockpit tasks. In addition, the proper interval between aircraft must be maintained, as the airplane pull-up point with high release-angle is near the bomb impact point. For obvious reasons, the aircraft interval should never be less than pull-up to impact time. Sufficient pattern checkpoints should be available so that an accurate interval can be maintained. Each pilot should have a predetermined point, about 15 seconds from the target, at which he checks for smoke from the bomb of the airplane ahead of him. If none is visible he must abort or chance hitting the bomb. This abort point should be established, then scrupulously adhered to.

Fatigue

During periods of intensive squadron training such as a deployment to Guantanamo, Fallon, or Yuma with its associated intensive bombing schedule, pilot fatigue is a major safety consideration.

At China Lake, where the bombing range is very close to the airfield, pilots began to notice that their landings immediately following a series of loft runs were below average. One pilot made a wheels-up approach but was waved off by the tower. Another pilot checked his gear four times before he realized the UP he was reading in the indicator meant his wheels were not down.

In view of the g-loads that the pilots underwent during loft bombing runs it was not surprising that they were less alert and experienced difficulty in performing the routine procedures involved in aircraft control. It has long been recognized that pilots become fatigued, both mentally and physically, much quicker and remain so longer following even short flights where they are exposed to considerable g-loads. *(It is imperative that these pilots wear and connect their anti-G suits; refer OpNavInst. 3710.7A—Ed.)*

Each pilot should be aware of the conditions that affect his G-tolerance and then strive to maintain his tolerance at its maximum.

Conclusion

Loft bombing requires the use of professional pilot techniques. The rigid requirement set forth by high-speed, low-level acrobatic maneuvers necessitates the pilots maintaining a high level of proficiency and experience. Each pilot must be aware of his own capabilities and not attempt to exceed them.

. . the g-altimeter technique for delivery pilots

by LCDR W. S. Stewart, BuWeps (Avionics)

SOME time ago an APPROACH article described a fatal accident during night loft bombing, and discussed the possible contributions of anxiety and vertigo. Anxiety often stems from lack of confidence, which in turn can result from lack of proficiency. In any event, the knowledge of a *simple* flight technique for performing the loft maneuver safely, on instruments, will do much to dispel anxiety. This prompts me to offer a flight technique for avoiding disorientation during loft bombing.

I lay no claims to originality in this flight technique, but it was new to us in the Red Rippers several years ago. After we had used it for a while and were sure it worked, we just assumed that other squadrons doing delivery work were aware of it, too. At that time, the other squadrons probably were aware of this technique, but time has passed, and a new crop of delivery pilots has come along. This explanation is submitted in hopes that two things will happen:

1. that all delivery pilots who are not now using this technique will think about it and give it a try, and
2. some means will be found to *insure* the future delivery pilots get the word (after all, how many back issues of APPROACH can we expect them to read?)

Here is the technique for insuring a safe loft maneuver:

keep the g on until the altimeter stops then roll out.

If the pull-up is begun from a reasonably straight and level attitude (i.e. not upside down), the altimeter will begin to increase, and a positive-g greater than 1 will be indicated on the g meter and will be felt by the pilot. If positive-g is kept on, the aircraft *must* go over the top. That is, the altimeter *must* continue to increase for a while and then start decreasing. Clearly there is a limiting minimum positive-g below which the aircraft will run out of airspeed before it goes over the top; this is a function of thrust available. There is no reason to ease off the g to this low minimum value; maintain the g used during the early part of the maneuver (or a safe margin on the stall, whichever is least).

Keep the g on and when the altimeter stops, roll out to a wings-level, upright attitude. You will then be in a slight dive, because the aircraft is still moving upward in space when the nose passes through the horizon. When the aircraft has actually stopped moving upward, the nose is below the horizon. This is the same sort of mushing you get in a pull-out from a dive; your nose is always above the horizon when the altimeter stops during a pull-out from a dive. In the same way, your nose will always be below the horizon when the altimeter stops during a loop.

Now for rolling out. The attitude gyro is there, but there is no reason for not using *both* of your wing position indicators—your attitude gyro *and* your turn needle. Roll out by displacing the stick with a positive, smooth motion and holding it there. The turn needle will deflect, then when the turn needle passes through the center, your wings will be level; neutralize the stick. The turn needle is a cross check on your attitude gyro. When you start your roll-out, the bug on the attitude gyro will be at the bottom (indicating you are upside down), and when the turn needle passes through the center, the bug on the attitude gyro will be at the top showing zero bank.

Now, which way does the turn needle deflect? You can demonstrate the answer to yourself by doing some barrel rolls. Starting from a slight climbing attitude, displace the stick, hold it, and watch the needle. It will first show a turn in the direction the stick is displaced, then this needle displacement will diminish as the aircraft approaches an inverted position.

When the aircraft is upside down and wings level, the needle will pass through the center; as the roll is continued, the needle will displace in the direction opposite to the stick displacement. As the aircraft nears the wings-level position (right side up), the needle will move toward the center, and when the wings are level, the needle will be in the center. So, which way does the needle deflect when you begin your roll-out? Opposite to the direction of stick displacement. This used to be good for a free beer at most bull sessions; it is easy to confuse true inverted flight with the upside down attitude experienced in a loop. They are not the same. (Caution: don't strain your arm or fall out of your chair when you try to work this out).

Well, what's so good about this technique? It has three anxiety-dispelling factors:

1. effectiveness (it works)
2. reliability (it works every time)
3. simplicity (it works every time even if you don't think).

First, *effectiveness.* You can demonstrate this to yourself in the simulator and in the air. It does not rely upon precision. If you keep the g on, you *must* go over the top. Even if you started rolling the instant you started your pull-up, you would still go over the top.

Two extremes of this premature rolling could be rolling into a steep bank at the beginning of the pull-up or commencing, and holding a rolling rate at the beginning of the pull-up. Both of these extremes could be confusing if you were trying to keep oriented by normal instrument procedures, but using the G-altimeter method guarantees recovery. In the first case (rolling into a steep bank), keeping the g on will alter heading, but the altimeter will still increase and then stop and then start back down. When it stops, roll out. In the second case (a continuous rolling motion), if you keep the g on, you *must* go over the top, and when the altimeter stops you can roll out. If you keep the g on, it is not possible for the angle of bank to be *less* than 90 degrees when the altimeter stops. That is, if you keep the g on, it is not possible for you to be right side up and make a mistake by rolling out into inverted flight.

Second, *reliability.* This method works all the time, and the *instruments* upon which it depends are extremely reliable. For an indication of g, what could be simpler than the g-meter? To back this up you have your anti-g suit inflation and your sensation of positive g. You can easily be fooled into thinking 'down' is 'up', but you can *never* be fooled into thinking negative-g is positive-g. For an indication of wing position you have the attitude gyro and the turn needle. If you have an air-driven needle, a double failure is even more remote than when the needle and gyro are electric. One point to make here is the reason for using a *smooth,* positive stick movement for the roll-out. If you oscillate the wings you can make the needle oscillate, but if you make a positive stick movement and hold it, the needle will give a usable indication even in rough air. Make a positive stick movement and hold it until the needle *reaches* the center, then neutralize the stick—don't ease out.

Third, *simplicity.* This method will work even if you are confused. Normal instrument scanning will work, too, but psychologists have demonstrated that the more excited we are, the more difficult it becomes to concentrate. When we are 'anxious' it takes a high degree of training and proficiency to keep up a full scan. With this g-altimeter method, you have but one thing at a time to think about. You don't have to keep track of events or keep oriented in space.

1. *Keep the 'g' on*
2. *When the altimeter stops, roll out* ●

LCDR WILLIAM S. STEWART is presently serving as Plans Coordinator, Avionics Division, BuWeps. He is a member of the Academy class of '45 and received an MS degree from Rensselaer Institute in '58. He has been checked out in 33 models of aircraft, 16 of those being in connection with attendance at Empire Test Pilots School, Farnborough, England in 1952. His operational experience includes three squadron tours with the emphasis on carrier types.

APPROACH IN PERSPECTIVE

By WILLIAM R. CAMPBELL

U. S. NAVY HYDROGRAPHIC OFFICE

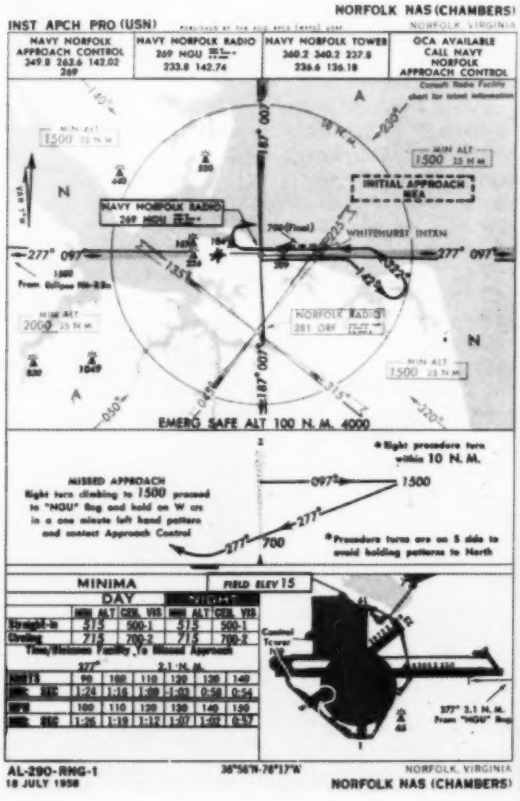
FOR SOME time now many observant pilots of military and civil aviation have expressed dissatisfaction with approach and landing (AL) charts which have not materially changed in the last two decades.

Designed to show pre-determined maneuvering for approach and landing to destination airport under instrument weather conditions, AL charts have proved to be somewhat deficient. Change of direction and change of altitude are shown by separate graphics. This requires an undue amount of eye shifting from one graphic to the other. Also, this twin graphic portrayal makes it difficult to visualize a three-dimensional picture of the required flight path. Further, present AL chart arrangement is conducive to misorientation. Change of direction in the plan view is oriented in relationship to true North while change of altitude in the profile view is strictly schematic in orientation.

Perhaps the true reason for present deficiency is that AL charts were designed from the ground up rather than from the air down. They present the cartographic instead of the more preferable operational approach to charting. Figure 1 is typical of standard AL chart presentation.

Historically, the unbreakable rule of charting is that of orientation to true North. It is self evident to operational aviation that aircraft are flown by relative direction, not by absolute direction. It is true that for the sake of consistency, direction is determined by relativity to true or absolute North. However, a pilot maneuvers his aircraft relative

Fig. 1



to his predetermined course by altering aircraft heading, as necessary, to maintain this course. If terminal area reference graphics are oriented in relation to the predetermined course, or more simply, to what the pilot sees along the nose of the aircraft, he is less apt to become misoriented at that critical time of flight, when he breaks visual.

Finally, the last big deficiency of present AL charts is that information included thereon is incomplete. All available frequencies for approach control and tower are not included. Radar frequencies and minimums are not included at all. Lighting, fuel and servicing facilities are either omitted or incomplete. Operational users must look in some other publication for this information. This situation causes delay in usage and also tends to increase the number of publications that must be carried in flight.

In summary, the three greatest deficiencies in present AL charts are:

1. Charts are difficult to read.
2. Induce pilot misorientation.
3. Information is incomplete.

Investigation toward AL chart improvement was initiated at the U. S. Navy Hydrographic Office by establishment of an AL chart portrayal criteria as follows:

1. Information must be clear, concise and easy to read.
2. Procedural data must be easy to understand and follow with accentuation of optical continuity.
3. Information must be complete to the extent that readability permits.

Examination of the present state of the art indicated that utilization of the perspective technique was preferable to other possibilities, such as, schematic drawings or photography of models. In the perspective technique, the item most critical in obtaining the best picture is selection of viewing direction and position. After numerous attempts from many angles and positions, it was found that a position above and behind the point of commencing the inbound course with viewing angle slightly offset from the inbound course was

Fig. 2

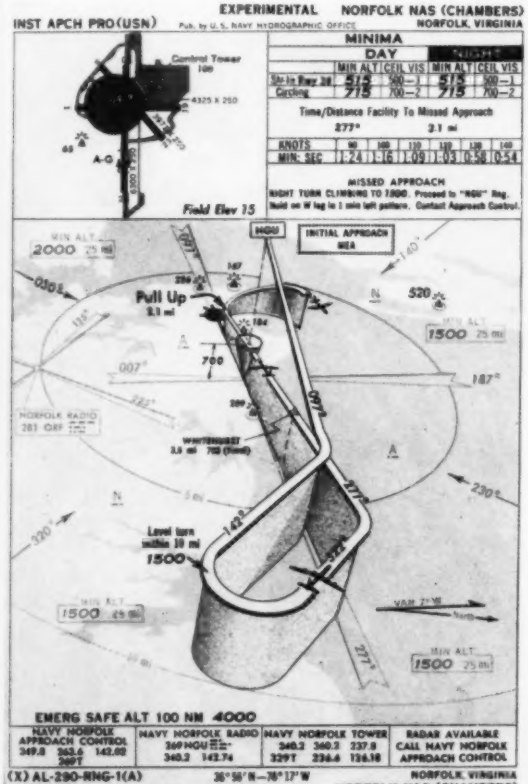
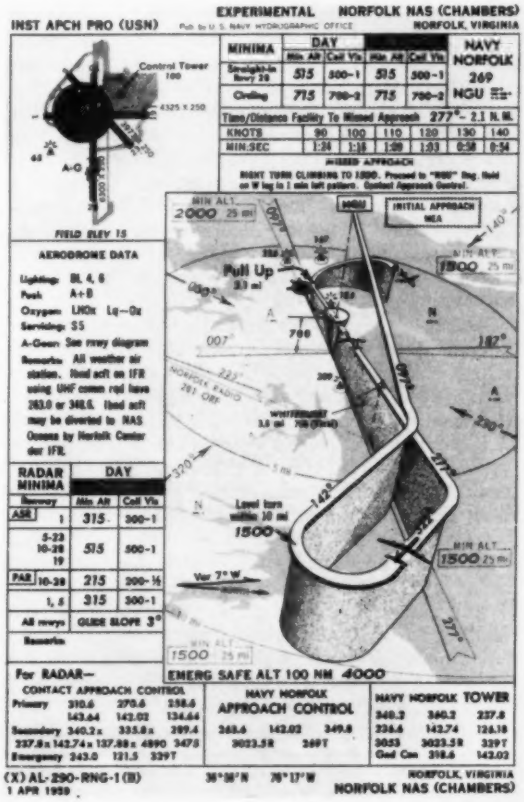


Fig. 3



While better presentation of approach and landing information is more critical for single-piloted types . . .

preferable. Stated in other terms, the viewing direction and position would be from bottom to top of chart with inbound course at a slight angular divergence from the viewing direction. This selection gives a pictorial perspective picture which compares to that as seen from the cockpit after turning inbound.

Orientation to true North and the perspective technique are incompatible. However, with selection of viewing position and direction to approximate the inbound course, it is believed that this incompatibility becomes an advantage rather than a disadvantage. It was attempted to enhance further cockpit orientation by alignment of the aerodrome sketch to show the authorized straight-in runway paralleling the vertical neatline. Prototype selection of viewing direction and straight-in runway alignment should reduce the present tendency toward misorientation when shifting from instrument to visual flight.

Optical continuity is accentuated through arrangement of frequency, procedure, runway and ceiling/visibility minimum data from bottom to top of page in sequence as normally used in flight. Also, associated procedural information is located on the picture adjacent to applicable position on the flight path. It is hoped that bottom to top page arrangement will eliminate the present need for yo-yo like shifting of eyesight while flying the instrument procedure.

Prototype perspective AL charts were produced in "A" and "B" format. In format "A" (see Fig. 2), the perspective graphic occupies the area now required for plan and profile diagrams. Chart content remains essentially the same as in current AL charts. In format "B" (see Fig. 3), the scale of the perspective graphic is the same as for format "A"; however, the area of coverage is reduced to allow space to show complete radar information and airfield services and facilities. The "B" version was prepared to explore the possibility of showing additional terminal data on the chart in lieu of listing this information in the Enroute Supplement. Note: Figures 2 and 3 portray the same instrument procedure as depicted in Fig. 1.

During July and August of 1959, six experimental perspective instrument approach and landing charts for NAS Norfolk and NAS Oceana were operationally evaluated. These charts were printed as individual charts and also combined with comparable standard AL charts in brochure format.

The method used for this operational survey was a written questionnaire to be completed by the user and returned to the Hydrographic Office. Fifty copies of the brochure, 300 copies of each experimental chart and 500 copies of the questionnaire were distributed to six different types of squadrons operating out of Norfolk and Oceana. A total of 203 completed questionnaires was received.

Six questions were asked. Questions and results are as follows:

If you feel like this on your next encounter with a complicated letdown too, please pass along your suggestions to Hydro. Your comments are herewith urgently solicited and can make a positive contribution to improving future flight information publications.

. . . even the "steering committee" in a larger bird has been known to make a wrong turn on an approach on waveoff.

1. The experimental charts were designed to provide a clear, easy to follow three-dimensional view of the instrument procedure track. Was this objective achieved?
Yes: 98.5% No: 1.5%

2. The perspective view is oriented to show the flight path to best advantage without deference to true North. Does this manner of orientation cause any undue difficulty?
Yes: 18.3% No: 81.7%

3. Associated procedural data on the graphics such as altitudes, courses, etc., are depicted adjacent to their applicable position on the perspective view so as to require minimum shifting of eyesight. Is this information clearly presented?
Yes: 94.1% No: 5.9%

4. The runway diagram is oriented in relation to the direction for straight-in approach, where authorized, instead of the conventional depiction of North at top of sketch. Do you consider this an improvement?
Yes: 86.5% No: 13.5%

5a. Some of the experimental charts contain tabulated aerodrome data and radar information, in addition to the instrument procedure, in an attempt to place pertinent terminal information on the same sheet. Is this desirable?
Yes: 84.3% No: 15.7%

5b. Does this tabular information significantly impair readability of the instrument procedure graphic?
Yes: 14.3% No: 85.7%

6. Please check the following statement which, from an overall standpoint, most clearly expresses your opinion of the suitability of the perspective AL charts as compared to conventional AL charts.

3.1% Prefer conventional AL charts.
7.7% Promising, but further development work should be done.
3.6% Have no preference as either would be satisfactory.
30.1% Might prefer experimental perspective chart after continued use of same.
55.6% Prefer experimental perspective chart over conventional AL chart and would recommend conversion of AL charts in Terminal Publications to this perspective format.

The overall results of this evaluation show an extremely favorable endorsement of the perspective approach chart. More than half of the pilots recommend immediate conversion of conventional AL charts to this particular perspective format while 30% indicated that with more usage, they might prefer the perspective chart. It is significant that only 3% of the pilots indicated a preference for conventional AL charts when compared with the perspective charts.

Due to the limited scope of operational evaluation, no decision has been reached concerning conversion to perspective AL charts. Final decision will be largely influenced by user reception. Consequently, your comments, both pro and con, are solicited. It is suggested that you ask yourself the six questions of the operational survey and forward your answers to:

U. S. Navy Hydrographic Office
Air Navigation Division
Attn: Code 5710
Washington 25, D. C.

MANY little things combined to make this particular ride a "hairy tale" for this Anymouse. It was late afternoon when we headed out of Litchfield Park for NAS Moffett. There were two of us in F4Ds; me leading with a wingman tucked on my port side. From the Moffett weather you would have felt nothing could happen—3000 scattered, 8000 broken with 10 miles visibility, but I had forgotten my California climatology: "April showers bring May flowers."

Climbing out we began to run into a light stratus layer. Since it was a VFR climb on course we used afterburner to get our assigned altitude before going IFR. At cruise altitude the soup closed in, but solid.

Other than this the minutes ticked away uneventfully and at Bakersfield our "fords" popped out of the high stuff, leaving us VFR on top of a broken to overcast layer. "Wingie" contacted "Metro" for the latest weather and found it was still three thousand scattered, eight thousand broken and ten.

As often happens when you start contacting people, they want to change the clearance. We were directed to Salinas omni, some 50 miles south of Moffett with an expected approach clearance some five minutes after our ETA there. So far so good. We had 20 minutes holding fuel aboard even though we had been forced to use burner in the climb-out.

Slipping into a holding pattern over Salinas, approach control was contacted and they gave us late Moffett weather. It was better than before. The three-thousand scattered was still there

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. As the name indicates these reports need not be signed. Forms for writing Anymouse Reports and mailing envelopes are available in ready-rooms and line shacks. All reports are considered for appropriate action.

— REPORT AN INCIDENT, PREVENT AN ACCIDENT —

but the broken was at ten-thousand and the visibility had gone to 15 miles.

However, tacked on to the weather report came another eight-minute delay in approach time. But who cares. The weather was apparently getting better and would probably be clear and forever by the time we got there.

Sure enough the eight minutes go by and we are cleared down to 20 thousand, initial penetration altitude. The joy we felt, as we came plummeting down, was short lived. No sooner had we reported reaching 20 thousand than we were cleared to hold some more—about 6 minutes. Once more we cleaned up and anchored. Approach control was notified that this was the last delay we could accept.

Apparently this did the trick because we were immediately told to contact "Coppertone" for a Rapcon GCA at our latest approach time.

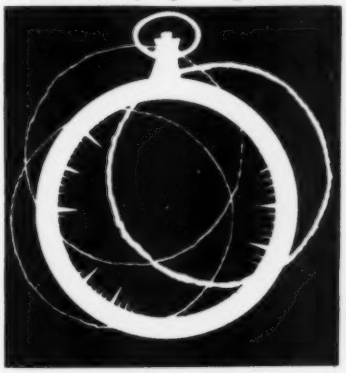
In contact with GCI we commenced an approach. At 15 thousand we went into the clouds in a tight section but right away we were in heavy rain. Now the F4D is no plane to be flying in the rain, particularly in section, since the visibility is just about nothing. Fortunately, I had called for defrost and lights *before* we started down. But even with his lights on bright my wingman was just a fuzzy blob a few feet away.

At 10 thousand we were handed off to GCA and continued the letdown. Now we began to wonder where that latest Moffett weather had come from. If the field was clobbered, as it was beginning to appear, our fuel situation could be critical.

Turning on base leg at 2500 feet we were still solidly in the clouds and rain. As our gear clunked into place we saw it—Moffett Field that is, through a hole off the port wing. Oh boy! The field was clear. The F4D is bad enough in the rain but we shuddered to consider a section landing in a rainstorm at night.

GCA's next transmission made us wish we had dived for the field through the hole. We were back in the rain and soup now and we were advised the precision radar had just gone down. This would be a surveillance approach. At minimums, a mile and a half from the runway, radar advised they would not be able to continue the approach due to a line-up right.

Adding power, and wondering whether or not to punt on this fourth down, my wingman sud-



denly sighted the field to port and jabbered "contact, contact." A moment later I realized we must be close as we chugged between the big hangar and a storage tower at what appeared to be cockpit level. Sure enough there was the runway a quarter mile to port.

Instantly realizing that a calm, professional aviator would not make another surveillance approach through the rain with 500 pounds of fuel, I called radar and told them we would make a low viz approach, landing downwind on the duty runway. My wingman took interval and we landed individually.

It was not over yet, however. Rolling on the runway I ran into the heavy rain again and I heard my wingman's frantic cries of "where are you?" I turned my lights bright and flashing and he must have caught a glimpse of them as he calmed down. Braked to a stop at the end of the runway, I was still in driving rain. Moments later "wingie" rolled up and we commenced looking for a taxiway or follow-me truck. The tower was cooperative, if uninformed, advising us that they couldn't see where we were but that we were clear to taxi if we could find a taxiway. Finally we searched one out and followed it to a parking area. Shutting down I noticed only a couple of hundred pounds on the fuel gage.

ALPHA DELTA SIGH

LISTED below are several observations and comments of possible interest to AD drivers.

● Erroneous airspeed readings. Place: night CV break and letdown from 800 to 150 feet (straight deck) no horizon and no lights. Symptoms: hard to slow down and descend. Stick becomes slightly mushy. Sudden reflection of port running light on wave top. Hasty pull-up. Upon closing the canopy the airspeed drops from 110 to 85 and altimeter goes from 250 feet to minus 20. Diagnosis: loose connection on manifold of static system. Recommendation: AD pilot check for change in airspeed when canopy is actuated opened.

● Cockpit complacency. In groove on night mirror landing. LSO calls "plane in groove, check lights on bright and steady." Events occur in following order: Reach over to far right-hand corner to check switches; the "cut" light flashes; with right hand on light selector and left hand on stick, there was no hand on throttle. Result: made jet type landing—no

flare. The LSO comment was meant for aircraft astern of me.

● Night cat shot. Ingenious system of using lights to indicate various things to cat officer. On catapult, tensioned up with one-finger turnup, and cockpit checked.

Now to check the lights. Let's see now: running lights on dim; fuselage light off; formation lights off, running lights on steady. I'm all set. Feet off brakes, catapult grip pulled out and throttle advanced, fingers hooked tight. I'm ready. Reach over with right hand to flip master light switch ON. Then brace right elbow in belly, stick neutral, wait for "swoosh" . . . wait some more . . . still more. Green wand still rotating? Yes. Why so long? Can't tell if lights are on or not. Does he see them?

Think I'll check that master switch. Reach over with right hand; remove gaze from instrument panel. Just in time to see green wand bounced on deck. Decide to replace right hand securely on stick as rapidly as possible. No such luck.

I can't get hold of stick until acceleration lets up. Make terrific climbout after uncontrolled catapult launch.

SHORT TIMER

ORIGINAL intent of the FJ-4B flight was a test hop. A normal mission was anticipated but alas, a surprise was in store for me—several in fact.

Climbing through 31 thousand an engine rumble was noted but there were no significant instrument variations. The climb continued to 40M and there I leveled out.

During preflight a reading of 1800 pounds of fuel registered in the "sump" and total fuel came up to 3400 pounds. No low-level warning light had come on but upon leveling out the liquidometer read only 600 pounds on the sump.

I diagnosed the trouble as improper fuel transfer and, to be on the safe side, turned toward home and started down in idle descent. While doing this I told the tower my trouble, requested clearance for a simulated flameout approach, and asked for crash equipment to stand by.

Then I sat back for some serious considerations—

(1) if I had engine failure prior to high key, where to turn, altitude to eject and various other problems involved in abandoning an aircraft,

(2) reviewing all circumstances so that I could adequately help ground crews in finding what went wrong with the plane,

(3) and organizing my thoughts to avoid panic—meanwhile trying to keep the bird aloft and running if possible.

Upon hitting high key I looked down and thought "This sure does seem high for 5000 feet." A check of the altimeter verified the altitude, or did it? A studied look proved complacency had set in and I was indeed 10,000 feet too high. Usable

fuel was down to 100 pounds. This is it.

I dirtied up with everything I had to expedite descent—I had confidence that with modifications a successful flameout pattern could be flown. Turning toward the 180-degree position that awful and anticipated silence occurred. Flameout!

Manual fuel, emergency ignition, etc., were flipped and a restart was gained. "Fuel control" I said to myself "accompanied by a faulty liquidometer." The relight lasted only a short time, however. Another restart was made. When I switched the emergency ignition OFF there was another flameout. Right here I was at the 90-degree spot, with correct speed and altitude. Another restart was successful but it too lasted only a moment.

My hand was getting fatigued from flipping switches and coming around the horn so often so I secured the whole mess and concentrated on landing.

I dropped in right on the end of the runway for an uneventful rollout.

Over a cup of coffee a discussion started and a close postflight resulted in finding an open circuit in the buddy tanker system which apparently caused the transfer failure. I still have no explanation for the lack of a low-level warning.

HELPMATE

BEFORE accepting a TV-2 for ferry, I test-hopped it and found the cabin pressurization not too good. Nothing else was wrong so I filed IFR (departure and destination were VFR) for drill. As it was very hot on the ground I consumed several Cokes between finishing the test hop and strapping in to take off on the flight.

At 37,000 feet I was on top of all clouds. The aircraft was running well but I noticed practically no pressurization. It started with moderate stomach pain. After one hour at altitude the pains became very severe and I began to feel faint. It was time to take some action. I contacted a GCI station and commenced a VFR descent off airways. GCI vectored me to a nearby Air Force Base and though the pain disappeared when I passed through 20 thousand feet, I decided to stop for the day.

The following morning I went on to my original destination without difficulty. Factors which contributed to the incident were a slightly fatigued condition, lack of cabin pressure and those two carbonated soft drinks. When you are in the state I was in, GCI can be a wonderful friend.

MEANWHILE, BACK HOME

THE TF-1 was on actual instruments. I was a passenger and was wearing the plane captain's headset. This is what I heard:

Approach control: "You are cleared to _____ for a back course ILS approach. Radar vectors will be provided. Report reaching (altitude) feet."

Copilot: "Roger."

CP to Pilot: "Is there a glide slope on the back course ILS?"

Pilot to CP: "I don't know."

APC: "Navy _____. Do you have ILS equipment on board?"

CP: "Affirm." (copilot trying to tune the ILS—no signal. The same unit functioned on omni enroute).

CP to APC: "Unable to pick up your ILS."

APC: "Navy _____. Continue approach. This will be a surveillance approach for runway ___. Present weather 800 overcast, seven miles vis . . . "

CP: "Roger."

At that point I removed the headset. There was no use in letting myself get further upset. Next time I won't wear the headset and will peacefully ignore the whole thing.

Of course another solution would be: more education of pilots with emphasis on practical factors; knowledge of what you don't and do have in the way of electronic gear; required demonstration of proper use of all equipment in all phases of operation.

PATROL PUCKER

WHILE on an operational flight on a P5M, I was IFRing up through the clouds to get on top. During the climb I was talking to a ground station and my scan was not continuous. Resuming my scan I saw the airspeed at 300 knots and rate of descent at 2000 fpm. I instantly commenced applying back pressure on the yoke. Then my eyes reached the gyro horizon. It indicated a normal nose high climb condition.

Pitot heat, which hadn't been needed before, was applied and the erratic instruments returned to normal in just a few seconds. The outside air temperature was pretty close to freezing as a result of the higher altitude. Application of pitot heat when commencing a climb into lowering temperatures will prevent such occurrences.

Have a problem, he'll

or a question? do his best

Send it to **headmouse** to help.

Individual Awards

Dear Headmouse:

It is recommended that the Naval Aviation Safety Center devise a method of distributing certificates and other suitable awards to individual pilots in operational squadrons who have demonstrated accident-free, professional, and safety-conscious flying . . . An award is now given to instructors in the Naval Air Basic Training Command for completion of 1000 hours of accident-free back-seat time. A similar criteria established by the Safety Center could be appropriate for pilots in operational squadrons . . .

SKIPPER

► Such an award has been suggested on several previous occasions and has been the object of considerable discussion in the past. Your recommendation of course has certain desirable features, the principal one being that of providing an increased incentive for pilots to maintain a high safety record. However, the disadvantages of an individual award outweigh the advantages.

Naval aviation safety is mainly a team effort with maintenance personnel as well as many others playing an important part. Consequently no one member of this team should be recognized to the exclusion of the others. However, the principal disadvantage to such an award is that there exists a tremendous variation in the type flying performed by naval aviators due to differences in mission and type aircraft. An individual award such as recognized in the Advanced Training Command is based on one type of flying and consequently can be fairly administered.

A similar program for the fleet would require as many standards as there are different types of squadrons. In addition, the standards would have to be modified to allow for carrier operations. For these reasons and based on experience from administering the current safety award programs an individual award could not be designed that would be equitable to all pilots concerned. Such an award would create more discontentment than incentive. The present system of unit awards is felt to be more in keeping with the concept of safety being an all-hands evolution.

Very resp'y,
HEADMOUSE

Mod. Procedure

Dear Headmouse:

On long flights over water at low altitudes as in ASW or low altitude search, the radio-ECM compartment of the P2V-5F gets unbearably hot. Flights are sometimes as long as 16 hours and due to personnel situation are flown "single operator." As a result, especially in case of the radioman, no relief is possible.

Existing air valves will not give this compartment enough cool air, no matter what arrangement is used. Hot air from electronics forward equipment (ASC 740) comes back and is trapped there.

This squadron has experimented with a vent installed in the radioman's escape hatch, rigged with a bungee actuated emergency shutoff, in case of engine or wing fire. Tests at different altitudes and airspeeds failed to reveal any adverse effect on the aircraft.

The Instruction which related to modifying one squadron aircraft and sending in a report after 60 days could not be found and, in case it was cancelled, an approach via the "Anymouse" route was elected.

ANYMOUSE

► See BuAer Inst NavAer 00.30A, also Headmouse in Feb '60 APPROACH, page 23.

Very resp'y,
HEADMOUSE

Wants Crash-Rescue Vehicle

Dear Headmouse:

A situation is brought to mind where firefighting equipment was unable to reach the burning wreckage of an F9F-8T because of soft muddy ground. The aircraft was completely destroyed, and, had the pilot and student been unconscious and unable to escape, they could have been burned to death.

To remedy this, possibly naval air stations could be equipped with at least one relatively light, maneuverable vehicle such as a half-track or large-tired powerwagon especially adapted for muddy or rough terrain. Also, an investigation might be made into the feasibility of a firefighting helicopter.

ANYMOUSE

► The need for a crash-rescue vehicle capable of operating with

such ground conditions as mud, sand, marsh, ice and soft snow has been under study by BuWeps for some time. (The Naval Aviation Safety Center has recommended the development or procurement of crash-rescue vehicles capable of traversing difficult terrain, preferably a vehicle with the ability to lift or move the aircraft once it is reached.) Three amphibious-tracked vehicles have been delivered to NAS, Corpus Christi, Pensacola and Brunswick for evaluation.

See BuAer Inst 11320.16 concerning an airlift fire extinguisher—a 700-pound unit carrying 400 pounds of powdered fire extinguisher designed to be airlifted by helicopter into areas not easily reached by over-the-road equipment. Firefighting personnel to operate the unit would also be dropped by helicopter.

Very resp'y,
HEADMOUSE

Flight Clearance?

Dear Headmouse:

" . . . re your answer to Anymouse in December p. 22—if your interpretation of *"at all times"* from OpNavInst 3710.7A is correct, you could *never* legally file VFR. I propose that the intention is for the minimums to apply to the point of departure, destination, and enroute flight . . . *at the time the aircraft is at that point*, that is, the area in which the aircraft is located at any one certain time. The local FAA people I checked with agree with me.

H. K. HOCH, LCDR
NAS Glynco

Dear Headmouse:

. . . I disagree, and refer you to OpNav Instructions 3710.7A, 3720.2A, and CAR 60 . . . I cannot find any thing that specifically instructs a pilot to file IFR in that situation. OpNav Inst 3720.2A says, "An instrument flight plan will be filed for all flights which may reasonably expect to encounter instrument conditions during any portion of the planned route." —and I don't think there was any reasonable doubt in Anymouse's case.

J. GALL, AC1
NAAS Brown Field

► LCDR Hoch, if we understand you correctly, you propose to let a pilot fly VFR anywhere as long as he has a bubble of VFR around him, moving along with him as he goes. This would be fine if it could be more guaranteeable, but how can you file VFR for a destination that is presently IFR? We interpret "at all times" to mean that when you depart on a VFR clearance, your departure point and your destination must *be* VFR. At the time your letter was written, your entire route had to be VFR too, but change 2 to OpNavInst 3710.7A now permits VFR flight above broken clouds or overcast as long as the departure point and destination are VFR. In December's APPROACH Anymouse said his destination was IFR. As for the local FAA people, they aren't governed by the more stringent requirements of OpNavInst 3710.7A as you and I are—see para. 4e.

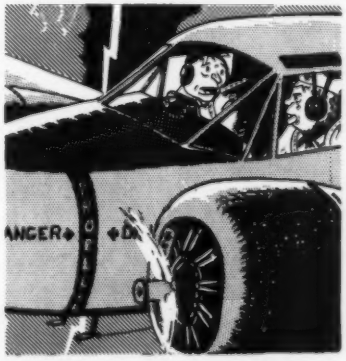
3710.7A is out of print right now, and I'm looking for it to be reprinted as 7B, with both changes incorporated, plus possibly some clarification of the IFR/VFR rules which are now subject to argument.

Air Controlman Gall, you're right—you can't find anything that specifically instructs a pilot to file IFR. As in all rules which say "don't do this under these circumstances," the implication exists that you should do *that* instead of this. If the weather doesn't meet the VFR minimums and you still want to go, you must go under the only other set of rules—IFR. The instruction you quoted is an instruction governing *Instrument* Flight Requirements; now turn to Section VII of 3710.7A and see if you could legally file and go under VFR. CAR 60 also has some good advice along with its rules —it says, " . . . the criteria contained herein prescribe the 'minimums' required for VFR flight . . . good operating practice requires that regular or continued flight in near minimum weather conditions be avoided."

Very resp'y,
HEADMOUSE

LOW BLOW

There have been five occurrences of tow aircraft being struck by 20mm projectiles during gunnery training in the last five months. During the previous two years there was only one instance. Each recent case was caused by an F8U firing at the banner from a low angle off.—Weekly Summ. 9-15 Nov '59



"He says we can top all this at 20 thousand and we're cleared to climb immediately if we want that altitude."

FUEL FLUKE

WHEN accepting an F8U-1 for a one-hour test hop, the pilot was advised by the plane captain that the aircraft was not fully fueled but plenty was aboard for a one-hour flight. The main fuel quantity gage tested O.K. and indicated 2700 pounds. In this particular F8U-1 the transfer fuel gage was inoperative (apparently not an unusual occurrence) and with only a partial fuel load it is impossible to determine actual fuel aboard until the main fuel quantity gage falls below 2700 to 2500 pounds.

Anyway, the pilot fired up and got airborne. After about 25 minutes of flight he push-tested the main fuel gage. It remained on 2700 pounds where it had been since takeoff. A reading of this quantity was normal for time in flight and the amount of fuel the pilot thought he had. Apparently though, there was something suspicious about the situation as the pilot cut short the anticipated one-hour flight and headed for home.

A normal entry into the traffic pattern was made but while rolling into a downwind leg for the east-west runway the pilot received definite information that all was not well: The needle on the fuel quantity gage plunged from 2700 pounds to 400. This was cause enough to wonder just how much fuel was actually left.

Continuing a normal pattern would involve some more downwind travel plus a base and final leg. The north-south runway was invitingly close and a steep descending 90-degree turn would put the aircraft in position for landing. A quick request was made and approved for an immediate landing on the north-south.

Excessive speed on touchdown resulted in a decision to drop the

hook for a field arrestment and engagement was made at 100 knots with no aircraft damage.

It didn't take much probing in the airplane's innards to find that the main fuel quantity gage had failed. Also, the plane captain was in error as to the quantity of fuel he thought was aboard.

To prevent a similar dangerous situation the squadron procedures were modified to require a full fuel load thereby allowing a preflight visual check of the wing fuel by using the float sight gages. An exception to the full fuel load was made for special flight purposes when authorized and briefed by the operation officer.

RAINS CAME—Weather Service described the 20 hundred weather observation as 3500 scattered, measured 8000, with 3 miles in light drizzle, fog and smoke; flying conditions marginal VFR. From the cockpit of an F4D it was indeed marginal. "I made a normal IFR GCA on instruments," said the pilot. "It was raining lightly during the final approach and my forward visibility was slightly impaired by rain on the windshield. The side panels were clear" (rain repellent, type FC-30, had been applied to the entire windshield two days earlier).

"Touchdown was normal, 25 units angle of attack, 132 knots. To the best of my knowledge I was lined up in the center of the runway and touched down just short of the mirror. Just after my nose wheel touched the deck, with throttle at idle, speed brakes out, and pitch trimmers coming up, I felt a thud as though I had hit on an obstruction on the runway" (The starboard tire was found to be punctured and was either flat at touchdown or immediately thereafter).

"The aircraft swerved to the right and began sliding. I immediately applied full left rudder . . ."

This swerve to the right was apparently checked by rudder as the pilot noted the nose swung back to the left. However the runway was very wet with puddles throughout and the aircraft continued to slide towards the right side of the runway.

At this particular field the runway lights begin to diverge from the edge of the concrete at the middle portion of the runway. They are two feet from the concrete, 1800 feet from the threshold and 27 feet from the edge of the runway at a point 2200 feet from the threshold.

The divergence of the runway lights is not normally a serious distraction during night landings. The restriction to forward visibility in rain, inherent in the F4D windscreen, causes a pilot to lean to one side of the cockpit and sight through the curved side panel.

It is conceivable, wrote the accident board, that the pilot, sighting out the side panel and seeing the diverging runway lights aligned with the path of his aircraft, may have been lulled momentarily into a feeling that his situation was not dangerous. Only when the port wheel left the runway did the pilot apply very heavy braking.

The port tire blew and shortly thereafter the F4D swung to a

When you're down to published minimums and still in the soup, are you . . .

GONNA COME IN ANYWAY?

Did you ever shoot a GCA that was so good, so smooth, and so well controlled that it seemed you were sliding down a wire anchored to the centerline of the runway?

Sure you have, and you have probably thought to yourself, or said aloud, that you would follow one like that right down to the ground on a zero-zero night.

But then on the other hand you've probably shot other approaches—not so precise—when you uttered a prayer of thanks that there wasn't a cloud in the sky. For some reason or other either you, the controller, or the equipment wasn't working right and you couldn't have hit the field with an A-bomb.

Often the bad misses are caused by a trainee controller. But he's got to start sometime and the only thing he has to practice on is you. Don't worry about a precision run under actual IFR conditions; only skilled controllers are authorized to control your aircraft then.

There are at least four variables which can make the situation more binding—controllers, the radar equipment, the weather, and you. But even under the best of situations, radar isn't perfect, and that's no insult to the system. It isn't intended to put you on the runway with your eyes closed. It has earned its keep when it puts you into a position from where you can see the runway visually. That's why it is called Ground Controlled APPROACH system.

course paralleling the runway. After some 500 feet in soft, moderately rough terrain, the nose wheel struck a small depression in the ground and it collapsed. Final stopping point was 100 feet to the right of the runway about 3000 feet from touchdown point.

It was noted the pilot did not shut down the engine prior to leaving the runway. Shutting down would not have prevented him from getting off the side but the added deceleration might have lessened the amount of damage that the aircraft sustained.

Experience in the squadron, plus information they obtained from other F4D units, indicates that the control of an aircraft with a flat tire on a wet runway is, at best, marginal. The most effective technique, according to the accident board, is to apply full rudder against the swerve and extremely judicious application of brake. This application of brake must be very delicate, as even moderate brake pressure can be sufficient to allow the tire to skid through a puddle on the runway and then blow on contact with a section of relatively dry pavement.

Policy in the command, when it is known prior to landing that one tire is flat, is to touchdown approximately 1000 feet short of the Morest, (mobile arresting gear) so that it may be engaged prior to losing directional control.

Mid-Air Collisions

From last summer to press time naval aircraft have been involved in 16 mid-air collisions during tactical gunnery or formation flights.

Aircraft involved in these mid-air collisions during this period have already cost four lives. Over eight million dollars worth of aircraft have been destroyed.

During this period last fiscal year the mid-air collision losses were considerably less—in fact there were eight associated aircraft mid-air collisions with no loss of life. Comparison of these two periods shows the rapidly increasing trend of mid-air collisions.

The problem of formation mid-air collisions has been the subject of many deep searching discussions at every level of command. The fact that there have been so many accidents during a phase of flight which is so basic and vital to military operations raises serious questions.

Accident records show two clearly established cause factors which have been present in nearly every accident: (1) Lack of, or failure to adhere to Standing Operating Procedures is the most significant single contributing factor, and (2) Pilots exceeding their capabilities in controlling the aircraft is frequently evidenced.

Immediate steps must be taken to eliminate those faulty flight procedures which have resulted in mid-air collisions.

INTERESTED BYSTANDER — The helicopter landed at a heliport and the pilot attempted to taxi it through a narrow, confined area, following the signals of what he thought was a taxi director. The "director" was actually an obliging sentry, not qualified to perform the task he had assumed. The 'copter main blades struck the corner of a hangar and another helicopter.

The Incident endorsement said, " . . . pilots should be aware that most people seem intrigued by rotary wing aircraft and often stand and watch them . . . this should not give the pilot assurance that they are qualified aircraft taxi directors . . . "

ONCE AGAIN — Re-entering the night FCLP pattern following a 20-minute engine cooling off period, an AD-7 pilot called at the 180 position and reported "gear-down-and-locked, check-off-list-complete." The LSO rogered and told the pilot to doublecheck his gear. The pilot rogered back that the gear was down and made a normal but slightly high approach.

A cut was given over radio by the LSO. Transition was normal and the aircraft landed wheels-up on external tanks . . .

One of the corrective measures to be employed in the future is a standardized "feel the control" system on final approach. This system requires the pilot to feel the position of the following controls which are all centralized in the AD aircraft: gear handle, prop, blower and flaps.

Accounting System for Safety of Flight Messages

RECENTLY published BuWeps Instruction 3750.6 provides information concerning accounting for Safety of Flight messages originated by the Bureau.

It directs that these messages be classified in three categories: by model aircraft, by model engine and by special equipment identification. The latter category will include the general miscellaneous area such as personal equipments, fuels and lubricants, oxygen, etc.

In order for BuWeps to maintain accountability of effective Safety of Flight messages and to assist aircraft controlling and reporting custodians in maintaining current effective lists of such messages, serial numbers will be placed in all Safety of Flight messages originated by BuWeps. Serial numbers will be assigned consecutively for each relevant model aircraft/engine/equipments beginning each calendar year. For example: "Safety of Flight A4D 2-59" would indicate the second serialized Safety of Flight message originated by BuWeps in calendar 1959 concerning A4D aircraft; "Safety of Flight Equipment 6-60 X Rain Repellent X" would indicate the sixth general equipment Safety of Flight message issued during calendar year 1960.

This procedure for serializing Safety of Flight messages became effective 28 August 1959 and is not retroactive. Therefore, Safety of Flight messages issued subsequent to that date and beginning with serial number 1-59 do not take into account Safety of Flight messages issued prior to 28 August during calendar year 1959 or preceding.

A record of all Safety of Flight messages originated by BuWeps is maintained by the Aviation Safety Coordinator (Aer-21). Information concerning serialized Safety of Flight messages is available upon request. Consistent with significant changes, periodic lists of effective Safety of Flight messages will be forwarded to controlling custodians, and reporting custodians of BuWeps controlled aircraft.

Controlling custodians, or in the case of BuWeps controlled aircraft, reporting custodians, will be action addressees for Safety of Flight messages. All overhaul and repair activities will be included as information addressees on all Safety of Flight even though the specific aircraft, engine or equipment concerned is not in custody at the time.

You Write the Caption!

HAY THERE!—What a revoltin' development this is! This unfortunate "hayburner" blew a tire on landing and eased itself off the runway into a stack of what horses might call a mighty tasty meal.

We're told the pilot left the scene with no comment to the hecklers, but YOU can comment by writing the caption for this photo. What would YOU say if you came upon this pastoral scene? Mail your caption direct to APPROACH, and include a safety tip if you can; we'll publish your contribution in a future issue. Our thanks to LCDR R. Klimetz of NAS Pt. Mugu for the photo.

GOOD WRITE-UPS: *the First Step to* GOOD MAINTENANCE

THE pilot greased the bird in for a smooth landing at a transient base and taxied to the parking area. After shutdown, he quickly entered a write-up in the yellow sheet—"UHF radio weak and unreadable." A few hours later he returned to the line for the return flight to his home base. He checked the yellow sheet to see if his write-up had been corrected and then grunted in disgust as he read—"Ground checked O.K."

There probably is not a more aggravating write-up in the world to the pilot than "Ground checked O.K." Yet, from the maintenance standpoint, this indication of corrective action may seem completely reasonable. For example, consider the write-up made above—is it completely adequate? What distance from the station and what altitudes were involved? What channels were involved, etc.?

Maintenance personnel, too, have gripes about the inadequacy of write-ups made by flight personnel. We can illustrate this by recalling the action of one exasperated maintenance officer. He posted the following on a large blackboard where all pilots and maintenance personnel could see it:

Write-up: Lost number three engine.

Corrective action: Number three engine found.

Those of us who fly the birds have discovered that to help maintenance personnel, we must provide them with as complete a descriptive report of the malfunction as possible. This is undoubtedly of more value to them than any other one thing we can do. Only too often though we find that what may appear as minor discrepancies to flight personnel and then forgotten may have indicated important trend significance to maintenance personnel because of past records they have available for comparison.

One of the most temper-testing write-ups of both operators and maintenance personnel is the recurring discrepancy. Pilots often voice unpleasant opinions of maintenance when they continue to have difficulty with the same unit they, or some other pilot had written up the day, or days previous. The mechanic who has changed the same unit several times, double-checked all connections, re-studied the HMI and still finds the same write-up, likewise is prone to become exasperated.

However, working at cross purposes is an awkward way to get a job done. The best way is to work together and both operations and maintenance are in agreement that the earlier the trouble is corrected, the better.

In one unit, recurring discrepancies are thermofaxed and before each flight, the air crewmembers check these thermofaxed records. This alerts them to any recurring discrepancies and they are particularly attentive to these areas. They do not only know that they have a problem, but they also know that the mechanics have a problem. If one or more repeat malfunctions shows up again they are more likely to write-up the most detailed information they can.

Another approach to the problem is to have the most experienced pilots assigned to test flight duties. Test flight work sheets can be supplemented to provide a check commensurate with quality of maintenance desired. Before each test hop, the records can be screened for recurring write-ups. The pilot can then make a positive functional check of any item or system which falls into the recurring category. In effect, if a malfunction is going to recur again, the pilot can make every attempt to get it to recur during the test flight.

Whether you fly them or maintain them, always do your part to *Keep Em Flying.* Remember that when a discrepancy is fixed, *and stays fixed,* everyone is happier, *and safer!—TAC "Digest"*

YELLOW-SHEET BOO-BOOS!

Yellow-Sheet Entries are the initial inputs to detailed, complex records systems. Please make complete, correct entries. Here are some common sources of errors:

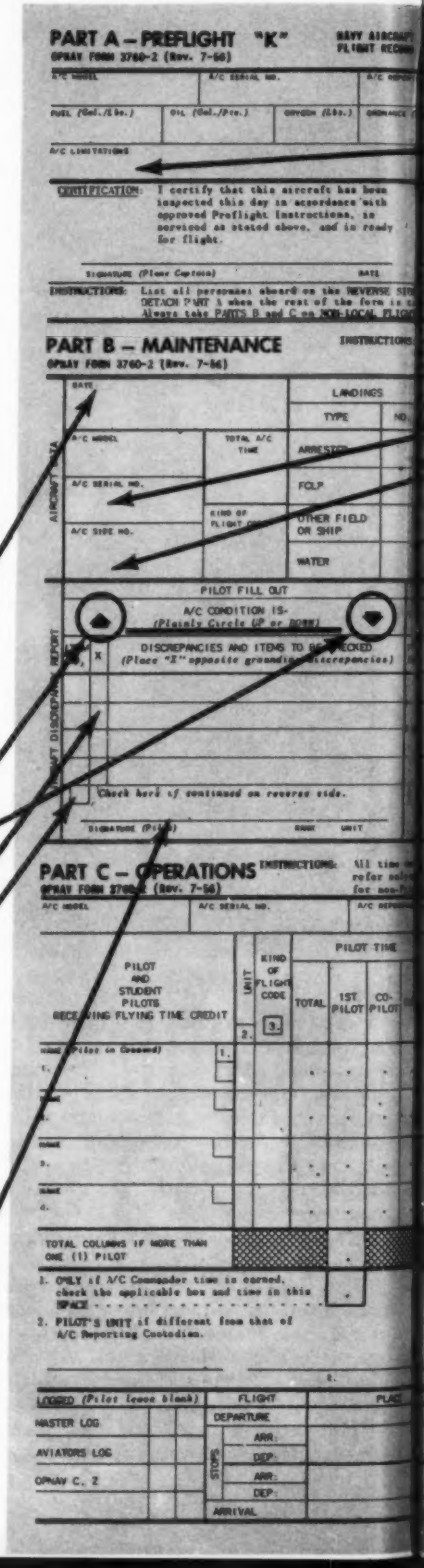
This is missing once in a while.

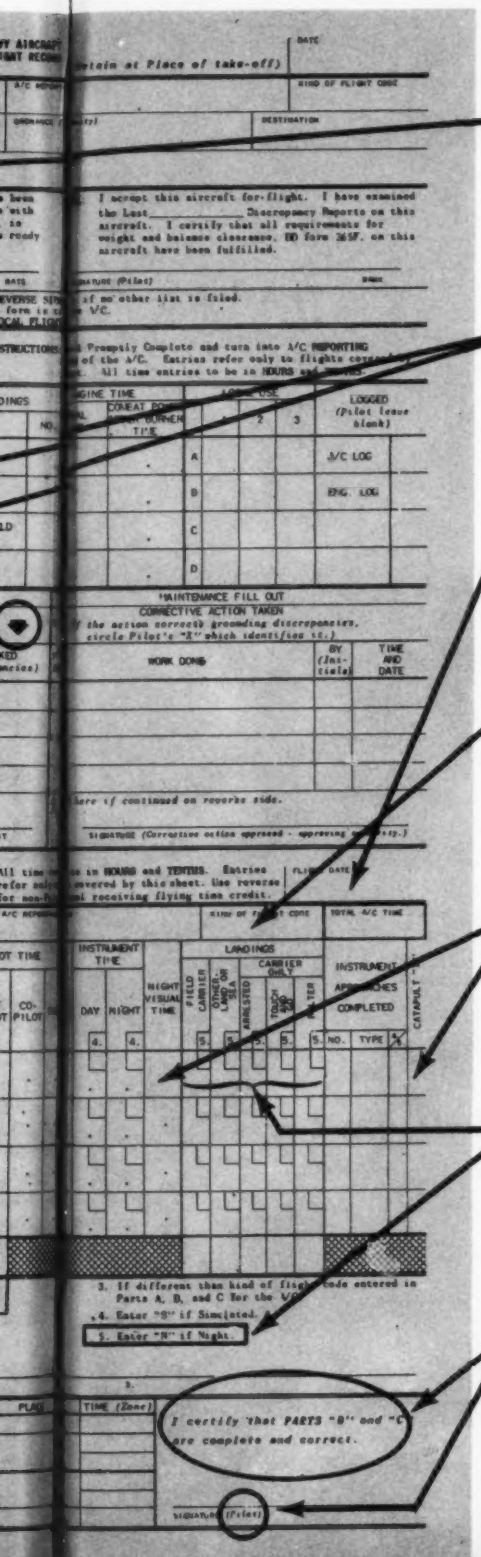
Don't forget to circle to mean UP—or DOWN

X means DOWN

Do you forget to (√)?

Once in a while, a pilot is too modest to sign his essay about Discrepanices.





Sometimes plane captains forget to note such things as "limited to normal flights," when appropriate.

All too often, the side number noted is not the correct one for the serial (Bureau) number recorded!

Wrong dates are noted frequently, too.

Sometimes the flight is different than what was scheduled (Example—Bad weather makes 1A2 become 2A2).

Does *not* include night IFR! Many pilots forget to make an entry for "cat" launches

How many pilots put an "N" in the box(es) to signify night landing(s)? Why not be different and do it?

This statement should leave no doubt about who is responsible!

'Man ditching stations!'

AS THE pilot's command crackled through the ICS of the P5M, the crew, already alerted to the impending open sea landing, braced for the ditching.

Until minutes before, the ASW/reconnaissance patrol flight had been routine. Then trouble began to develop with startling rapidity. The first indication had been aircraft power failure. Seconds later, a shout had come from the flight deck—"Fire in the No. 1 engine!" The radioman reported to base radio that the aircraft had a fire and was ditching.

Corrective measures failed. Flames and black smoke poured out of the engine and over the wing. As the pilot passed the word to man ditching stations and began a slight right turn, the starboard engine backfired violently three times. The pilot hit the flap switch to drop full flaps and reduced power on No. 2. Trailing smoke, the stricken aircraft broke out of the clouds at 100 feet and 105 knots. A 10- to 15-knot wind whipped squalls along the surface of the heaving ocean.

Through the rain-streaked windshield the pilot quickly surveyed the seas for the best heading. Holding the nose up, he watched as a swell rolled along the starboard side and passed under the aircraft, then he touched down. The aircraft bounced once slightly but maintained attitude. As the pilot closed the No. 2 throttle, the starboard engine quit completely. Only the sound of water pounding against the hull of the aircraft could be heard in the silence. The big dark blue plane majestically rode up and down two or three more swells, then forward motion ceased. The pilot checked the time. It was 1318.

No Chance of Putting Fire Out

A quick look at the port engine convinced the crew standing by with fire extinguishers that there was no chance of putting the fire out. Flames poured from the engine on all sides and licked along the wing.

The emergency had occurred too quickly for the navigator to pass the aircraft's position to the radioman. The radioman, however, managed to send a "safe on the water" message to which a "roger" acknowledgement came in as the pilot was giving the command to abandon the aircraft.

The pilot turned on the master armament power in the cockpit and the copilot, using the navigator's panel, released the ordnance load. As the two men passed through the smoke-filled after station, flames were already burning through the port fuselage by the wing area.

The copilot checked quickly for the Mk-7 life rafts, Gibson Girls and food containers but these had already been removed by the crew.

The water breakers and the life raft emergency container sank when thrown into the water. (Each life raft contained seven small tins of rations and seven solar stills and desalter kits. However, the seasick survivors did not use them.)

The pilot and copilot went out the starboard after hatch on the lee side of the aircraft. About 50 yards away, they could see one Mk-7 life raft inflated, with a line of crewmen in the water between the plane and the raft. All the men were wearing inflated life jackets. Oil and gasoline were burning on the water's surface. A head count showed that all 10 occupants of the plane had escaped without injury.

Crew Mans Rafts

The second Mk-7 life raft failed to inflate properly and was floating upside down. A crewman in the water beside it shouted for assistance. Other crewmen helped him right the raft and inflate it.

The pilot and copilot inflated their life vests and swam to the two rafts. After towing the rafts to a safe distance from the burning plane, the survivors climbed aboard, five men in each. The pilot took command of the first raft and put the navigator in charge of the second.

The survivors tied the rafts together three ways before achieving a satisfactory arrangement. Tying the rafts side-by-side produced excessive pounding. End-to-end and close together, the rafts jerked the line too much. Finally the men tied the rafts together loosely, stern-to-bow, about 10 feet apart, with a sea anchor attached to the bow of the lead raft.

The aircraft burned down to the waterline and sank about 40 minutes later. Gasoline and oil continued to burn on top of the water for another quarter of an hour. Muffled explosions heard by the survivors shortly after they abandoned the plane were thought to have been the Practice Depth Charges going off.

Survivors Put Radar Reflectors Up

Tying all gear down, the survivors fastened a radar reflector in the bow of each raft.

It was later learned that small discrete signals from the corner reflectors were picked up by a searching plane. However, the signals were only intermittently present on the radarscope (due probably to the high waves hiding the corner reflectors when the radar sweep passed the area of the rafts) and a track could not be plotted.

Two of the crew broke out the Gibson Girls while the rest bailed. One of the transmitters proved inoperative. Neither Gibson Girl signal lamp operated although one worked briefly initially.

The first attempt at using the Gibson Girl failed when the kite broke loose from the antenna wire in the strong wind. The kite was subsequently recovered. Meanwhile the survivors sent up the kite and antenna from the inoperative Gibson Girl after fastening the antenna securely to the kite.

About two hours after abandoning the aircraft, the survivors sighted a P5M at about 200 feet of altitude, four miles away. Visibility was so poor that the search pilot did not see them. The survivors put dye marker over but it failed to attract attention.

UF Spots Rafts

Ten minutes later they heard another aircraft and waited expectantly. A UF broke out of the rain headed almost directly for them. The survivors fired two daysmoke signals and the UF pilot spotted the rafts. He later reported that he had had trouble keeping the rafts in sight because of the low visibility and several times homed in on the strong signal from the Gibson Girl. When he began to circle at a low altitude, the survivors reeled in the Gibson Girl antenna to short stay. After circling the survivors for some time, the UF disappeared.

Fifteen minutes passed. The men let the Gibson Girl kite back out and began to send on the transmitter again.

"A few minutes later," the pilot reports, "here came the UF and before we could do anything about it, it had passed almost directly over us and cut our antenna with its right wing. They threw out a parachute-retarded can, however, which turned out to be a PRC-17 radio."

Cutting the antenna, the AAR states, was due to three factors: 1) poor visibility and a low ceiling forced the UF pilot to fly at about 150 feet to stay below most of the clouds; 2) the kite which has a 306-foot antenna was up about 200 feet and therefore was above the UF pilot who was looking down and 3) the Gibson Girl would not put out a signal unless the antenna was fully extended.

Make Report Over Transmitter

Although the survivors were unable to receive on the "walkie talkie," the transmitter worked long enough for them to report to the UF pilot that they were all safe with no injuries. The UF made a number of equipment drops, but all drops were upwind except the first and it was impossible for them to recover the equipment. Even with sea anchors out and the survivors paddling furiously,

the rafts drifted much faster than the equipment. The UF stayed with them until dark, then disappeared from the survivors' view.

The second Gibson Girl kite had a broken brace. The survivors repaired it and made another attempt to fly it, but the strong wind and a slightly fishtailing kite snapped the wire. By now the night was dark and rainy. The wind had increased to 30 to 35 knots and the ocean swells to 15 to 20 feet. The rafts took more water and spray broke across them. Bailing was continuous. The cold seasick survivors huddled in the sloshing bottoms of their rafts under tarpaulins and Gibson Girl parachutes and tried to get as comfortable as possible for the long night ahead.

"Exposure suits of the quick-donning type (one for each man aboard) were carried in the aft stowage area. Due to the rapidity with which the fire spread, ditching with the absolutely essential survival gear was all that could be accomplished."—MOR

Survivors Sight Ship Lights

Shortly before midnight, the men sighted the running lights of a ship. Five minutes later, they saw a second set of lights directly downwind of them.

Revived now that rescue seemed imminent, the survivors waited until the first ship was close enough, then fired night flares sparingly and held up the reflective surfaces of their raft paddles.

Personnel aboard the Coast Guard cutter later reported that the reflector paddles aided materially in keeping track of the bobbing rafts in the searchlight and aided significantly in the execution of a prompt and efficient sea rescue under adverse conditions.

The survivors operated the hand transceiver in the hope the ship would home on this signal and turned up the Gibson Girl with output connected to the radar reflector. When they thought the searchlights were about to sweep their way, the men fired daysmoke signals. All their flares and daysmoke signals worked properly and were credited with the initial visual contact between the ship and rafts.

Turn Flashlights ON Simultaneously

At a signal, the survivors turned on their life jacket flashlights. The ship picked up the rafts in its searchlight beam. At this, all hands aboard the rafts shouted in unison and blew their whistles.

The ship placed the rafts on its leeward side. As the rafts drifted alongside the ship, men on the deck tossed lines down to the survivors and hauled them up a scramble net and safely aboard. The time was approximately 0100. The survivors had been in the water some 12 hours.

"The training of pilots and crewmen can be stated as the principal factor that prevented an extremely hazardous situation from becoming a tragedy. The training of all hands brought about their speedy rescue in excellent physical condition."—AAR

"Ditching requires more coordinated effort by the crew than any other operation. It is important that an exact ditching procedure be followed and ditching drills be diligently practiced at every opportunity . . ."—P5M-2 Flight Manual

Preflight of Survival Equipment

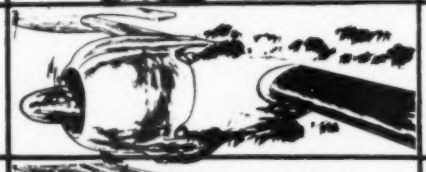
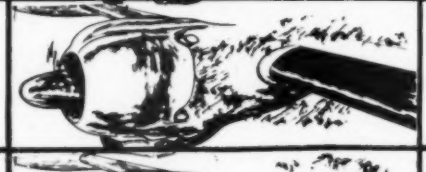
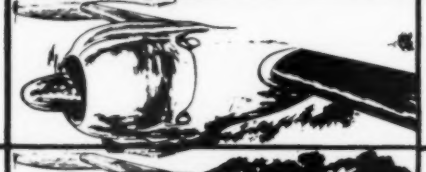
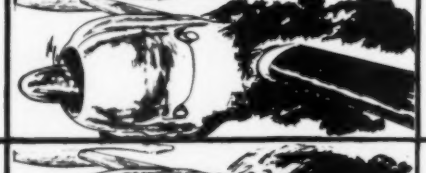
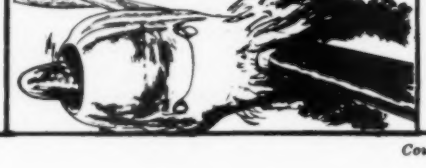
"Prior to boarding the aircraft all crewmen and pilots were gathered together. The life vests and parachute harnesses were lying on the ground for inspection. Each man put on his own life vest, checked his CO_2 bottles and tightened the harness. Then each man put on his own parachute harness.

"As squadron survival officer and copilot of the aircraft, I asked the only crewmember without a flight suit where his was. He replied the suit was in the wash. I noticed few of the men had knives. Knowing that Aviation Equipment had none in stock, I remarked that each man should wear one even if the cost comes out of his own pocket. I was wearing a compass tied to the front of my flight suit and stated that they were now available at Aviation Equipment and that each man should get his. Our second mechanic had the only other compass. We mentioned PSK-2 kits but these also have not been available in the supply system recently. All crewmembers had hard hats (required only for takeoff and landing) and all crewmembers wore flight deck shoes."—*Copilot's Report* ●

Well Done

For his outstanding performance of duty during the episode described above, a WELL DONE is extended to LT James D. Henson, VP-50. His correct evaluation of the situation and quick decision to ditch; his skillful airmanship in accomplishing a single-engine, open sea landing under most adverse conditions of weather and sea state and his leadership while in command of two Mk-7 life rafts are considered the primary factors in the saving of 10 lives.

SMOKE SIGNALS YOU SHOULD KNOW

SMOKE		CAUSE
Thin black smoke from exhaust stacks.		Carburetor too rich—improper combustion.
Puffs of black smoke from exhaust.		Engine detonating or backfiring.
Thin grey smoke coming from cowl flaps.		Exhaust stack or cylinder head failure.
Thin black smoke followed by large volume of white smoke from exhaust system.		Induction system fire that has ignited.
Large volume of white smoke from cowl flaps.		Indicates induction system fire that has burned through intake pipes.
Smoke from intercooler flap.		Accessory section fire burned through intercooler.
Large volume of dense black smoke from any area aft of cowl flaps.		Oil fire in accessory section, probably due to broken line.
Black smoke with orange-yellow flame from any area aft of cowl flaps.		Fuel fire in accessory section, probably due to broken line.

Courtesy of the Flight Safety Foundation Inc.

Realistic Emergency Drills

ALL of our bird-herds hold periodic drills on emergency and ejection procedures and all pilots are sure that they have the procedures down to a fine art. But do they? Take a thoughtful look at the results of a recent realistic dry-run.

One of our Marine Attack Squadrons took an A4D and dearmed the seat and external racks, bled the bungee, and fixed things up generally so the pilot could push or pull any gadget in the office without shaking up the insurance companies. Then taking each pilot, they strapped him in and shot emergency situations at him covering flameout on takeoff, 30,000 feet, and ejection, under the benevolent supervision of the squadron aviation safety officer. Since each pilot had 400-500 hours in the A4D, the results were most interesting. For example:

—All pilots knew their emergency procedures without reference to the panic-book, but most pilots had never pulled all the emergency gadgets and hence did not know just how *far* to pull them out of their sockets. The common tendency was to pull them until the hydraulic lines and landing gear came out thru the dash.

—During flameout on takeoff with shoulder harness locked, more than 70 percent of the pilots could not reach the emergency bomb release handle to jettison the external stores.

—Some pilots forget that they have a 200-foot ejection capability with the zero-length lanyards installed and would have ridden the bird in to the ditching.

—Some pilots tried to turn the airstart switch ON with the throttle not fully back in the idle detent. This is physically impossible if the throttle is forward a few inches. The exact distance varies between different aircraft of the same series.

—Some pilots, during an airstart, accidently kicked the airstart switch to OFF as they came around the horn on re-start below 20,000 feet following a high altitude flameout. This happened when the throttle handle was advanced a slight bit too far when going from OFF to IDLE. This can be avoided by coming around the horn *slowly*.

—Approximately 75 percent of the pilots subconsciously bent their heads when pulling the face curtain. This can put a strain on the neck and back such as to cause you to imbibe your orangeade with a straw.

—All pilots concerned expressed the opinion that they learned a few things during the drill that they hadn't known before. And this is good! — *1st MAW*

Checklists

WHEN the wife asks you to stop by the commissary to pick up a few items, the chances are that you ask her to make a list. When you finish pushing the basket down the aisles, you're pretty confident that you haven't forgotten anything — (got your wallet?) Just take a look at your desk and you'll see other memory aids—the daily calendar pad, the list finder with phone numbers, the planning guide. If you're especially efficient, you'll have a notebook in your pocket that you use to jot down reminders.

It seems odd that the same man who *will not* trust himself to remember a phone number or a half dozen grocery items *will* trust himself to remember in the neighborhood of a hundred required inspection items during his preflight. The C–47 requires the check of 39 separate items from the time you sit down in the cockpit until you start the first engine. The T–33 requires the check of 61 items. Add the exterior preflight, the pre-taxi, taxi, engine-run, and pre-pound this with an attempt to remain current in several different aircraft you'll have to admit that you just cannot justify not using a checklist.

The Air Force has recognized this, and we finally have good, concise, logically sequenced, standard checklists — both amplified and condensed in each of the Dash 1. AFR 62–2 requires that the appropriate checklist (amplified or condensed) be referred to directly by each crew member during ground and flight operation of all Air Force aircraft, except during taxi, takeoff, landing, and critical emergencies. In the latter instances, the checklist items that apply will be reviewed either before performing the phase of operation, or after it, as a "clean up" reference.

If you're one of the non-users, you probably insist that "I've never used one before" or "the checklist just confuses me." They are both pretty weak reasons and would probably not justify violation of an Air Force Reg.

We have good checklists now so let's use them as required by regulation and by good common sense. The cost of forgetting something important is high.—*Robbins AFB Bulletin.*

BEWARE the PROPELLER!

Constant vigilance is the price of safety on the flight deck. Recently, an experienced flight deck director walked into a turning propeller of an S2F. Miraculously he only sustained serious eye injury. In this age of jets, missiles and rockets, the old warning "Beware of Propellers" is still valid.

Before . . . Not After

AFTER an explosion and fire in flight, the pilot of an FJ-3 ejected some five or six miles off shore. Thirty minutes later, he was rescued by helicopter. In his comments on the accident, he states that he thought his bailout oxygen bottle was not functioning properly because he could not exhale. He opened one side of his mask which allowed him to exhale sufficiently.

Oxygen from the bailout oxygen bottle comes into the mask under continuous pressure and does not shut off automatically on exhalation as in a demand system. When using the bailout bottle, you must exhale with force in order to open the exhalation valve against the stream of oxygen coming up the hose.

Under normal breathing conditions, the bailout oxygen supply should last from 7 to 10 minutes. As the oxygen in the bailout cylinder decreases, there is a corresponding decrease in the pressure in the cylinder. Because of this some pilots have abandoned their emergency oxygen equipment after the first minute or so of use mistakenly believing that the oxygen supply has failed.

Flying personnel should learn about the bailout oxygen system through experience *before* rather than *during* an actual emergency. It is recommended that squadron safety officers make arrangements with the parachute riggers to provide this vital ground training.

Strike Damage

THE pilot of an F8U-1, which crashed due to the folding of the port wing on takeoff, suffered a minor concussion which rendered him unconscious for about an hour. His only other injury was a facial abrasion.

"The aircraft was a 'strike,'" the reporting flight surgeon states, "as would have been the pilot had he not had a good fitting APH-5 helmet (with Hardman retention kit and nape strap), his straps tight and an intact canopy."

Extended Protection

REPORTING on an accident in which fire broke out as the aircraft made an emergency landing, the flight surgeon recommends that pilots ask plane captains strapping them in to turn up the pilot's flight suit collar. In the event of fire, the collar will extend the burn protection provided by the flight suit.

In the accident in question, the fire was intense enough to ignite the pilot's oxygen mask and APH-5 helmet yet the pilot suffered only a narrow band of first and second degree burns on the

back of his neck. The fact that the pilot's flight suit collar was turned up, the flight surgeon states, limited the area of burns he received.

Testimonial

"THIS ejection can be added to the growing list of successful ejections which have become a vivid illustration to naval aviators that safety equipment, if handled intelligently and utilized correctly, will save lives." — *Flight Surgeon in MOR*

Rescuers Must Know Equipment

WHEN the number 2 wire aboard the carrier failed, an F4D-1 went over the side, crashed into the water, disintegrated partially and sank.

The crew of a plane guard helicopter at the scene 20 seconds after the crash sighted the F4D-1 pilot floating face down, his parachute open. Immediately, the helicopter crewman went down to retrieve the pilot. Evidently believing he was dealing with an integrated torso harness such as worn by pilots of A4D and F8U aircraft, the helicopter crewman thought cutting the upper straps would release the parachute canopy.

"I went into the water to make an immobile rescue," the helicopter crewman reports. "I inflated one portion of my mae west prior to entering the water. When I entered the water the pilot's chute was open so I tried to cut him out of the harness and held his head up out of the water to keep him from drowning. I succeeded in cutting one chest strap when my legs became entangled in the shroudlines at which time I inflated the second portion of my mae west . . . I then cut the second chest strap and tried to get him on the rescue seat. I believe I got him on one prong and gave the helicopter pilot a thumbs up and he started to hoist us up. The pilot of the F4D was pulled off the seat and it was apparent at the time that he was still attached to the chute by his leg straps. I went back in the water to try again (but) I lost sight of him . . . "

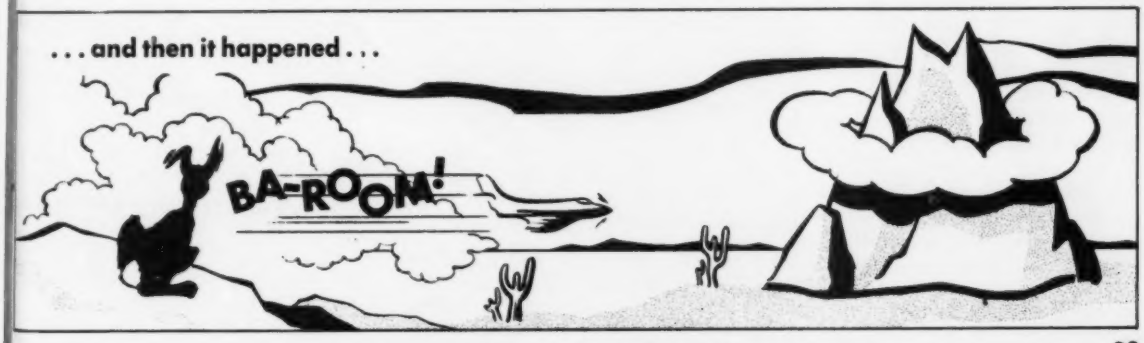
The helicopter pilot reported later that he saw the open parachute go deeper down in the water until it disappeared from sight.

The AAR recognizes the fact that "the helicopter crewman worked hard under extremely trying and hazardous conditions and made a very determined effort to recover the pilot (who) was incapacitated at the time by reason of severe injury or death."

In this case, in all probability had the crewman been able to bring the pilot aboard the helicopter, the outcome would have been the same. However for its value in relationship to other helicopter rescues, we pass along the following AAR recommendation: *Helicopter crewmen must be made intimately familiar with the personal equipment carried and worn by the pilots and aircrews of the various aircraft types used on the carrier.*

A Stitch in Time

SUMMER is on its way. Pilots and crewmen who have been flying in exposure suits are probably breaking out summer flight suits about now. Others fly in summer flight suits the year around. In either case, now is a good time to make sure that summer flight suits have wrist and ankle binding tapes as required by BACSEB 9-56: Summer Flying Coveralls, modification of sleeve and trouser cuffs. These cuff tabs give the cuffs a close fit which keeps them from snagging on objects in the cockpit and riding up or tearing during free bailout or ejection. If your flight suit doesn't have cuff tabs, see your parachute rigger. ●



"Nuthin' taller than a jackrabbit on this prairie, watch me kick up a dust storm."

THEN

In 1941 the 120-hour check for an F4F consisted of 150 inspection items . . .

Today planes such as the F8U have over 1000 inspection items for the same check.

NOW

Kick the Tires?--or Overhaul?

By LCDR Donald L. Briggs

With experience should come the elimination of some inspection items in the HIR— but the trend seems to be in the opposite direction. As result "minor" inspections are reaching overhaul proportions!

WHICH way does it go in your squadron on the Daily and Preflight Inspection or on periodic inspection? Of course, neither way is right but probably anyone in a modern fleet squadron would say that requirements of the Handbook of Inspection Requirements (HIR) are nearer an overhaul than they are to "kicking the tires." Many complaints are heard concerning the excessive time required for inspection of modern aircraft and the resulting poor availability.

In 1941 the F4F-4 had 150 inspection items on a 120-hr check which required 2 or 3 men one day to complete. Today the F8U has over 1000 inspection items on the same check, and squadrons report a down time of several days with many more men working on the airplane. Our complex modern aircraft impose severely frequent inspection intervals and many inspection items, and these drain

our maintenance resources at a crippling rate. And the end is not yet in sight. Inspections now account for some 60% of non-available aircraft. Can you imagine the combat readiness we'd have if we could eliminate inspections? Instead of five aircraft temporarily out of service, there would be two! If we could afford to provide each squadron enough additional aircraft to offset the high non-availability caused by inspections, we would also have to provide enough additional manpower and facilities to inspect those additional aircraft—or else suffer a further reduction in availability from a further thinning of the existing inspection manpower.

If only one item were to be inspected on an airplane, it would get a most careful inspection. With 1000 items to inspect, does each get the same attention? Of course not, although we like to pretend that it does. Each additional inspection item tends to lower the quality of all other inspection items. It takes very nearly an hour to properly conduct a preflight inspection on the F3H in accordance with the HRI. Yet, carrier cycle times are often such that the time devoted to landing, respot and launching leave barely 30 minutes available for the preflight inspection. Obviously some of the items weren't properly inspected. Which one? Only the inspector knows and he isn't talking. Would it be better to drop some of the less important inspection requirements so at least the more important ones were looked at? Is the pure length of the inspection creating an unsafe situation? What can be done? Certainly the problem will be with us from now on as airplanes become increasingly complex. Are there reasons other than complexity for the growth in inspection requirements? If there are, perhaps something can and most certainly should be done.

Scheduled or periodic Inspection Requirements are originally formulated by the aircraft contractor and forwarded to the Inspection Requirements Branch, Service Test Division at the Naval Air Test Center for further evaluation during the Board of Inspection and Survey Trials (BIS) and the Fleet Introduction Program (FIP) of the aircraft. The aircraft contractor frequently doesn't know a new pump, valve, or other component will function under fleet usage, so, he sets the inspec-

If the pure length of an inspection is creating an unsafe condition then it appears the problem will become greater as airplanes become more complex.

When recommending inspections, it should always be ascertained that it is necessary and feasible, that it will solve the problem, and that it will not create other problems.

tion criteria and interval allowing a great safety margin for his lack of knowledge. Many items of this type are adjusted during the BIS trials and FIP of the aircraft. The result is the HIR which fleet squadrons receive. It is expected however (largely with negative results to date) that fleet squadrons, with increasing experience with the aircraft, will recommend elimination of some inspection items, or increased inspection intervals, as usage indicates it is safe to do so. Have you submitted such recommendations? Practically all new items added to the original HIR are based on fleet recommendations or are added as a result of fleet problems. How many have you added? Have you arrived at that place in the AAR entitled "Recommendations"—and drawn a blank? Did you say, "Well, we can at least recommend an inspection in the future; that's safe." Have you gone out with a message recommending a continuing inspection without first ascertaining that you had a continuing problem which an inspection would solve?

When recommending inspections, it should always be ascertained that it is necessary and feasible, that it will solve the problem, and that it will not create other problems. Inspections are "Murphy's" big opportunity. Is the inspection important enough to accept the degradation of other inspections? Will the inspection disclose incipient trouble? For an inspection item to be accurate and valid, it must require that a definite condition be sought. The inspector must be able to detect this condition by sight, feel, measurement, or it must require him to accomplish a specific task. Remember that the reviewers and endorsers up the line are not as familiar with the equipment and its operation as you are, and they know it. If you recommend an inspection they will almost always buy it. The general attitude throughout this proc-

Inspection requirements branch experts from Pax River get together with P5M operators to determine check sheet needs.

ess seems to be that "It only takes a minute," but 10 of these minutes add up to 10 minutes, and 60 such inspections add up to one additional hour.

If you are submitting a recommendation for a new inspection can you answer "YES" to the following statements?

1. I have read and understand the explanatory pages of the HIR.
2. The inspection is not a restatement of an inspection already in the HIR.
3. The inspection will disclose a specific remedial condition.
4. The item to be inspected will often fail or failure is catastrophic.
5. The inspection or access will not cause the failure which the inspection is designed to eliminate, or a similar failure, or failure of a related component.
6. The interval has been established at the maximum figure feasible and a longer interval will not detect the incipient failure in time for preventive maintenance.
7. The deficiency found which generates the new inspection recommendation was not caused by local maintenance personnel malpractices.

If you can answer all of these questions *"yes"* then you can also answer *"yes"* to the question: Is this inspection necessary? If the answer is *no* to any one of them then the inspection is not valid as stated and should be eliminated or restated.

It is thus apparent that each unnecessary periodic inspection not only decreases availability but also decreases safety. It is therefore extremely important that only those periodic inspections that are valid and necessary be contained in the HIR. Each activity should periodically review the HIRs for the aircraft which they operate to insure that all inspections listed are necessary and conversely that all necessary inspections are listed.

Of equal, if not more, concern are the numerous "special" inspections generated by "possible safety-of-flight messages." While the majority of such recommended inspections are valid, a growing number of cases have been noted which apparently were generated by maintenance personnel errors or malpractices (i.e. line or fitting failure due to overtorquing, fuel or oil filters found missing, ejection seat misrigging, skin cracks, tubing, wiring, and hose chafing, etc.). Such items, when prematurely reported with a recommendation for inspection of all subject model naval aircraft prior to further flight, result in lost aircraft availability, questionable inspections, and, again, letting "Murphy" get his fingers in.

Instructions for the submission of recommendations for additions or deletions to the HIR are contained in each copy of the HIR. It is you, the operator of the airplane, who decides what inspections are in the HIR.

Timely, sound and constructive recommendations for "check sheet" changes are invited. ●

LCDR Donald L. Briggs is presently Head of the Inspection Requirements Branch, Service Test, NATC Patuxent River. He recently completed a tour as Executive Officer of VF-31 which was deployed in the Mediterranean with F3Hs during the Lebanon operation. During World War II LCDR Briggs flew night fighters in the Pacific theater winning the DFC and Air Medal with two stars. Since World War II he has had several tours in all-weather fighters including a tour on exchange duty with the USAF. He is currently qualified in the F3H, A4D, F4D, FJ-4, T2J, and TT.

FROZEN CONTROLS

IT HAD been raining heavily for about 14 hours prior to the launch, when two F8Us were scrambled from the alert pad. As the aircraft leveled off at 38,000 feet, one F8U experienced stiffening of the control stick in the fore and aft direction. The condition progressed to a point where the stick could not be moved fore or aft, but the ailerons and rudders were effective throughout the course of the hop.

The second F8U also experienced a stiffening of the control stick fore and aft although it never did completly freeze. Normal and emergency pitch trim worked satisfactorily in both aircraft. The flight leader led a Tacan penetration using trim to control the aircraft. As the aircraft descended below the freezing level, the pitch control gradually returned to normal and an uneventful landing was accomplished. The pilots had correctly analyzed the situation when the trouble was encountered.

Moisture had accumulated in the horizontal tail control push rod, which froze the control linkage solidly in the first F8U or greatly restricted the movement as experienced in the second F8U.

As soon as the aircraft landed, a complete check of the entire horizontal tail control linkage was conducted. No obstructions were found in the entire system. Troubleshooters then focused attention to the horizontal tail control push rod (Fig. 124, Item 33 of IPB). Excessive amounts of water were found around the push rod particularly in the two openings around the push rod sleeve in both aircraft. CO_2 was applied to the first F8U and the push rod was solidly frozen. CO_2 was also applied to the second F8U with the lubricant and dirt that had accumulated. The

push rod froze solidly.

Nine other aircraft were checked and frozen prior to being cleaned; however, very little or no moisture was present when the tests were conducted. Conditions were encountered varying from no restrictions to a momentary frozen condition. From all appearances these trouble shooters decided that the specified oil was not used when this assembly was serviced.

The HMI specifies that the push rod be cleaned and oiled with MIL-L-7870 oil every 120 hours. Mechanics then serviced one aircraft as specified in the HMI and tried to freeze the control assembly. The push rod could not be frozen in this manner. Water was added to the oil and CO_2 again applied. On this attempt the linkage became stiff although it still would have been possible for the pilot to have adequate control of the aircraft under these conditions.

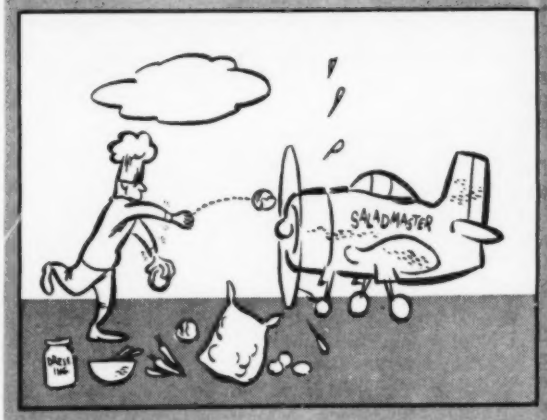
A condition of serious consequence did arise through the course of the investigation. If the control linkage becomes frozen either in the air or on the ground, too much force or pressure on the stick could possibly buckle or tear the bulkhead fitting to which the push rod control attaches. If the push rod was torn from the bulkhead, it may be possible to buckle the control linkage due to non-support or bind the control linkage on the lower part of the bulkhead. Dirt entering this area through the door assembly, left-hand only (cooling vent) (Index 104, Fig. 214) will adhere to the push rod possibly requiring more frequent servicing of the push rod. The addition of dirt to the oil will allow moisture to accumulate if the amounts of dirt or grime become excessive.

The squadron recommended that:

a. The lubricant specified in the HMI be used when servicing the horizontal tail control push rod.

b. The horizontal tail control push rod be visually checked each 60 hours to insure that excessive amounts of dirt and water have not accumulated. If this condition exists, a complete servicing will be required at this time.

DID YOU KNOW—That peak temperatures are reached inside tires about 15 minutes after maximum brake application? The heat build-up and transfer from the brakes to the wheel and tire is rapid during max braking action such as during an abort or high-speed emergency landing. Tires, wheels and brakes can't stand much over 1000°F of temperature so you must be alert for conditions which may cause a wheel explosion and park in designated areas until your brakes cool down.



AND HEADS FELL—A T28 was turned up to 1200 rpm and several heads of cabbage were thrown into the propeller to demonstrate for line personnel the danger of personnel getting into propellers. Pieces of cabbage entered induction system and generator air blast tube requiring carburetor change.

The reporting unit noted this was a well intended demonstration by a junior officer who was concerned with the inherent dangers of line personnel working hurriedly in close proximity to many turning propellers on a flight training line. It was undoubtedly an impressive, although unorthodox and unauthorized, demonstration. It was recommended that instead standard methods of indoctrination of line personnel in safe operating procedures be continued.

ON THE OTHER HAND—One activity has been experimenting with painting propeller tips using orange and white "Day Glo" paints. The project is authorized by BuWeps and NAMC. The idea is to reduce or eliminate ground accidents but has proven helpful in in-flight visibility areas also. Tests indicate the most successful scheme appears to be one-inch white, three-inch orange, and one-inch white on a black painted propeller blade. The single engine aircraft have only the backs of the blades (away from pilot) painted to prevent glare to the cockpit area. The orange paint reflects well in sunlight while the white is excellent at night when incandescent lights are used.

SENSING SHORT—The forced landing of an HRS-3 was brought about by fuel exhaustion caused by a malfunctioning fuel gage. One amplifier tube (12AT7) was inoperative causing the fuel gage needle to stick in a position indicating 210 pounds remaining when all usable fuel had been consumed.

Failure of the tube was attributed to water found in the well on top of the fuel tank through which the sensing probe passes.

To ensure correct calibration of the fuel gages and further, to maintain the aircraft at an operating weight commensurate with the operating unit's SAR capabilities, the following policy was adopted:

Alternating tanks (forward and aft) will be filled to capacity on alternating flights, giving a total of 700 lbs. This procedure is deemed necessary inasmuch as the design of the filler neck precludes the use of a dipstick to measure fuel quantity.

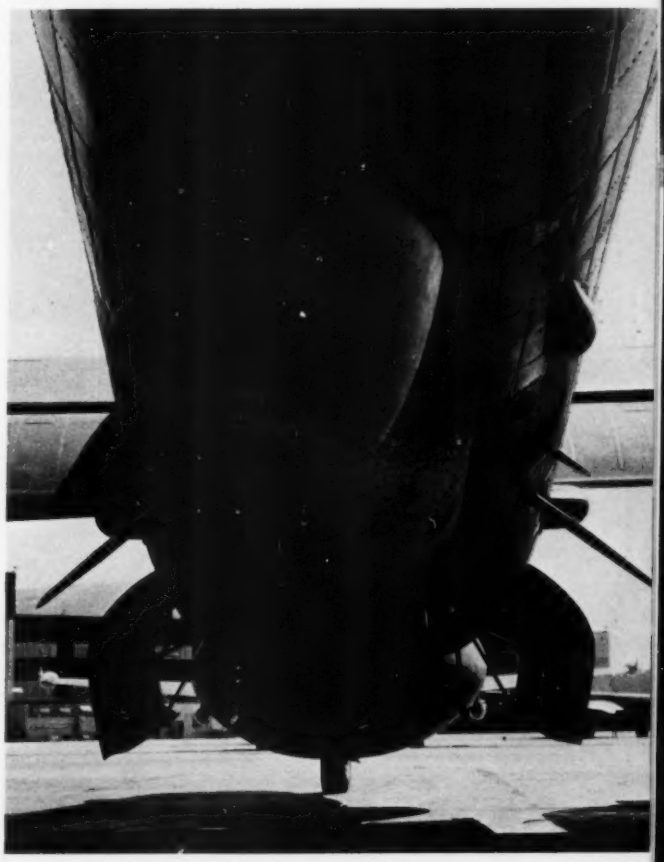
BOMB-BAY BLAZE — During flight gas fumes were experienced in a P2V. The bomb-bay doors were cracked, the tower notified, and an emergency was declared. A normal touchdown was made. Upon propeller reversing about 1500 feet down from the approach end of the runway a flash fire occurred in the bomb bay and along the aft fuselage section. Unreversing was completed immediately after noticing the flames, batteries and generators were secured, roll-out completed, and the aircraft was abandoned.

The bomb-bay fuel tank was secured in such a manner as to make it possible to pump the fuel out into the bomb bay. During installation of the bomb-bay fuel tank, the fuel transfer line quick-disconnect fitting was leaking. Because a replacement part was not available, the fuel transfer line was removed and the bomb-bay selector valve was capped to prevent fuel leaking. It was erroneously believed that the bomb-bay tank coupling part Part No. 6-57A was a self-closing fitting which would prevent fuel from flowing from the bomb-bay tank.

The accident board commented: "This incident is the direct result of cumulative errors by the maintenance and operation department, not to mention the errors made by the pilot in judgment and operation of the aircraft. However, there was no culpable act apparently involved but rather a contributory lack of knowledge on all personnel directly concerned with the operation of equipment installed, as well as a total lack of coordination between the shop personnel, the scheduling personnel and the flight personnel.

"Although the plane commander, copilot and plane captain stated the bomb-bay fuel pump was not turned ON in flight, the investigation disclosed it was and would have been impossible for the fuel to run into the bomb bay in flight without the pump being turned ON. The amount of fuel in the bomb bay precludes the possibility of siphoning. Repeated checks of the P2V-7 fuel systems in the squadron have proven beyond a doubt that it is impossible for the same condition to be repeated without the bomb-bay boost pump being turned ON.

"Wide dissemination of this report to all squadrons and units operating fleet type aircraft is recommended in the hope that others may profit by this expensive and bitter lesson. Again it has been proven, there is no substitute for close and continual supervision in the maintenance and operation of naval aircraft. A continuing program of education for both ground and flight personnel is a necessity and not a luxury to protect equipment and personnel from damage and injury."



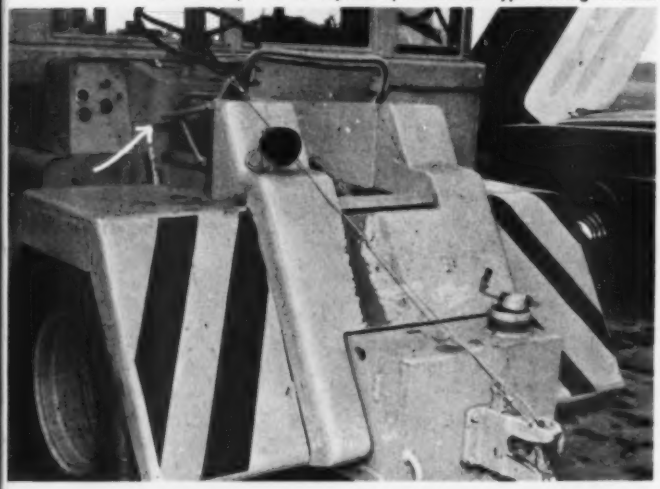
MULE HITCH—Accidents involving tow tugs with a quick release mechanism located where it can be accidentally tripped by the driver brought about recommendations that this lever be relocated to a position behind and slightly below the driver's seat so that a definite effort would have to be made to utilize the mechanism when needed; also that towed apparatus be safety-connected with a chain or cable arrangement the same as is required for towed trailers upon automotive highways.

The design of the tow hitch on the ME-1 mule is such that it is spring-loaded to the closed position. However, there is no positive method to insure that it will stay locked in the closed position.

The reporting squadron has drilled a hole in the hitch below the hook arm. This will enable operating personnel to insert a pin in order to prevent inadvertent unlocking of the spring loaded hitch.

BuWeps is initiating correspondence which will direct replacement of the quick release hitch by the clevis and pin type hitch incorporated on all tractors procured within the past five years. The bureau interposes no objection to the use of chains as recommended. However it is recommended that such chains be attached permanently to the towed equipment and not the tractor.

Clevis and pin is to replace quick-release type towing hitches.

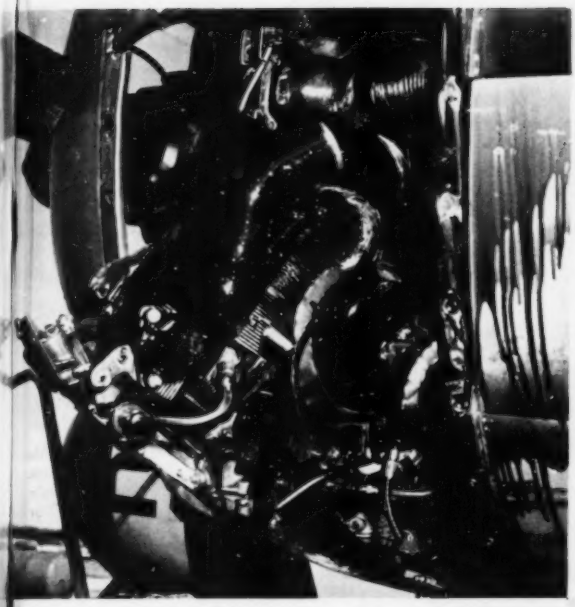


LINE POLICE—An air station skipper reports he has virtually eliminated all vehicular aircraft ground accidents on his ramp by appointing a CPO as line area policeman. This old respected chief checks speed, operation, condition and care of all line service vehicles, work stands, etc., and has been very successful in this effort.

UNQUALIFIED—The driver tried to pass under the wing of this R4Q-2 with a fork lift. The upright rails of the fork lift struck the under side of the aircraft wing rupturing the skin and main spar about 12 feet from the wing tip. The driver was not familiar with nor qualified to operate this type forklift. Therefore, a cause factor of supervisory error was assigned.

USE SAFETY CHAIN—A follow-me pick-up truck was towing a MD-3 power unit, when the power unit became unhitched and struck this F9F-8T. A nut had become unscrewed from the bolt securing the towing hitch on the MD-3 power unit. The bolt worked loose and fell to the ground approximately 50 feet from the rear of the aircraft and the towing bar of the power unit, being spring-loaded to the up position, became disengaged. The insecure nut was not detected during inspections.

To eliminate the possibility of similar occurrences the reporting unit has installed a one-inch link safety chain connecting towed apparatus to the towing vehicle.



OVERBOOST has determined the most probable cause of cylinder failure in this S2F's engine.

OVERBOOST—After a normal takeoff, the S2F commenced to climb to 1500′ when the pilot noticed vibration in the port engine. Shortly thereafter a loud thud was heard, at which time the pilot turned back toward the field and began scanning engine instruments. No loss of MAP; RPM, pressures and temperatures remained normal. He looked at the engine and saw one of the cylinders off (see photo above). He feathered the engine and landed.

Overboosting of the engine, not necessarily on this particular flight, is considered to be the most probable cause for this incident. All pilots were reinstructed to review the BMEP maximums for 1820-82 power plant; also cautioned that throttle settings must be decreased prior to decreasing propeller RPM when changing power settings, especially after takeoff.

CHEWED OUT—During preflight run-up an SNB jumped the chocks and ran straight ahead 27 feet and collided with the SNB parked directly in front of it. The second SNB was not tied down.

This ground accident was caused by the failure to secure the tail section of the SNB to the deck. In this case, the mechanic was in a hurry to preflight the aircraft because of the early arrival of the pilot for a scheduled flight.

The fact that one SNB was parked 27 feet directly behind another SNB and both aircraft turned-up at the same time set the stage for this accident. Wind blast effect on the second SNB combined with a handbrake that is not exactly foolproof allowed the aircraft to bounce and move about to such a degree that the mechanic either touched the brake pedal or the parking brake did not hold. At any rate, the mechanic could not cope with the situation and is not completely sure of the sequence of events.

Comments and Recommendations of the Board: Negligence on the part of the mechanic caused this accident. Adequate instructions on line operations of all squadron aircraft are published and promulgated. However, negligence by this mechanic might have been bred through the fact that insufficient emphasis have been placed on specific safety pre-

Non-observance of safety rules led to this ground accident.

cautions and that previous violations of these safety regulations have met with little opposition by NCO's and other supervisory personnel.

Recommendations:

That a renewed effort be made to educate all hands in the necessity of strict compliance with all safety regulations and that this program be emphasized on a continuing basis.

That closer observation and supervision be exercised by all officers and NCO's and that immediate positive action be taken against any and all offenders.

That a study be made of the space available and every effort made to place the aircraft in some position other than directly behind each other for engine run-ups.

An A4D was being jacked for landing gear check. Upper extension of jack under port wing failed, allowing port side of aircraft to fall. Top of jack punctured wing. Upper extension of jack was over extended. When jack received weight of aircraft, remaining engaged threads stripped, allowing aircraft to fall. This is one of two nearly identical types of jack, one of which has a 20-inch upper extension, the other (this type) an 8-inch extension. Personnel involved assumed all to be the same, and as there is no stop or warning mark to indicate the situation, the jack was extended to a point where only one or two threads retained the failed part, rendering it incapable of supporting the aircraft.

SHORT JACKS—A mechanic was attempting to jack an F9F-8T up to perform a drop check on the landing gear hydraulic system. The screw adapter of the jack was extended, to meet the nose, for about 6 inches. The mechanic was unaware that the extension in the jack was one of a short type and that approximately ½-inch of thread remained in the jack. When the aircraft was raised the small amount of threads gave way to one side and the aircraft fell on the jack.

The reporting command utilizes jacks produced by various manufacturers. Of these, the "Regent" jack is the only one with a 6" final stage mechanical extension. All other jacks have a minimum of a 12" extension.

It is recommended that the last 2" of the mechanical extension of all jacks be painted red.

THROTTLE LINKAGE FAILURE—NASC records indicate that there have been at least two jet aircraft saves credited to the installation of J65 Engine Bulletin 240 (automatic throttle governing device). Basically this change causes the fuel control to go to 82-87% if a failure of the throttle linkage occurs.

Information on such occurrences is vitally needed by designers to evaluate the effectiveness of safety features in considering similar type installation. Reports should be made by AMPFUR. Has your squadron had a save and was it reported?

WHISTLES FOR DIRECTORS ONLY—During a night carrier flight deck re-spot an A4D-2 was maneuvered during a left turn so that the starboard horizontal stabilizer tip struck the left wing butt of an A3D-2 which was tied down with wings folded. Both aircraft received damage. The reporting command said the cause was due to failure on the part of plane director to assure that adequate wing watchers were available and equipped with whistles.

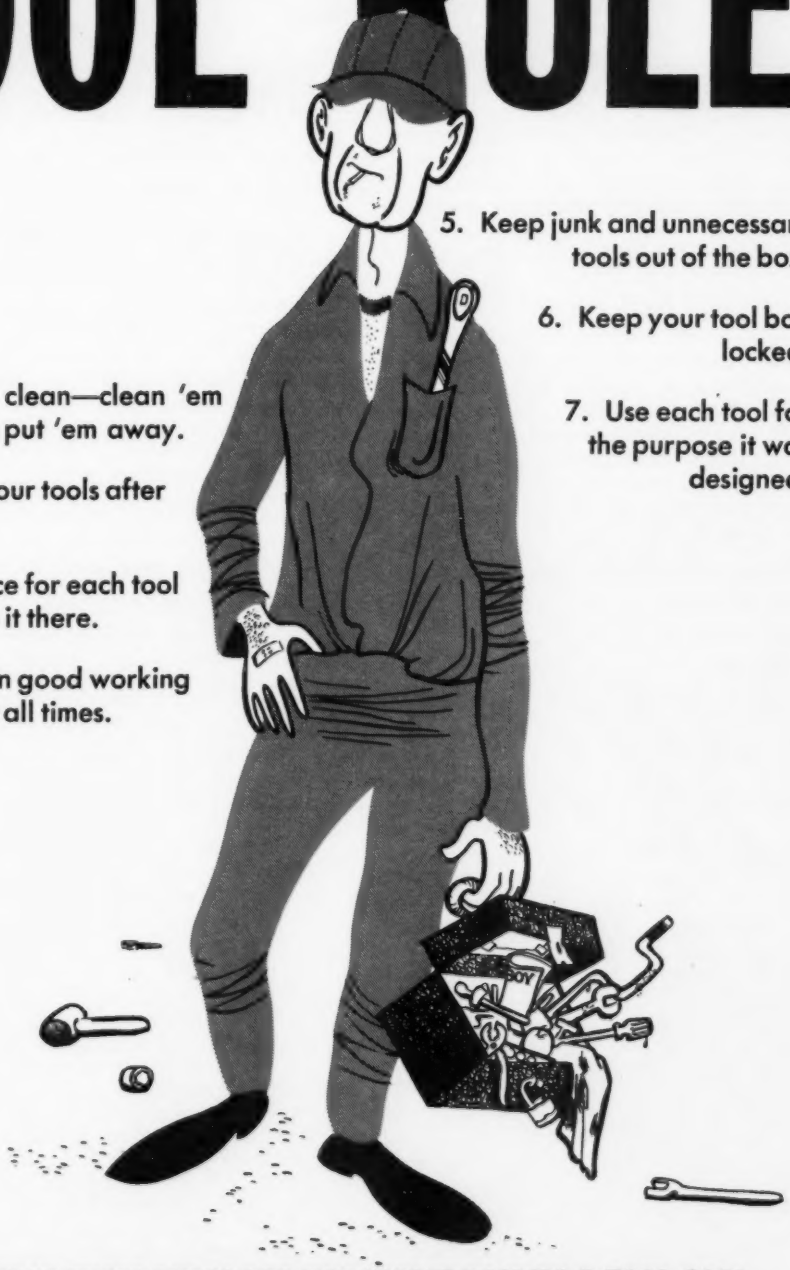
Comments and recommendations of the board—The plane director during this accident had only one wing spotter. The spotter was not equipped with a whistle. The plane captain in the cockpit of the A4D-2 was unable to hear the wing spotter's yell which occurred at the last minute to stop the aircraft. The plane director was also manning the tow bar.

It is recommended that the plane director when moving aircraft have a minimum of a four-man crew. This would include a plane captain in the cockpit, port and starboard wing spotter, and a tow bar man. The plane director and wing spotters should have whistles. "Plane directors will do no other job but direct the movement of aircraft."

Reviewing authorities disagreed with the recommendations in part stating: "No one but the plane director can be allowed to have whistles or confusion will result." ●

TOOL RULES

1. Keep tools clean—clean 'em before you put 'em away.
2. Inventory your tools after each job.
3. Have a place for each tool —and keep it there.
4. Keep tools in good working condition at all times.
5. Keep junk and unnecessary tools out of the box.
6. Keep your tool box locked.
7. Use each tool for the purpose it was designed.



OBSERVE THESE RULES AND YOU WON'T BECOME A TOOL FOOL

Improper Parts, Service, Workmanship Source of Engine Troubles

Findings, conclusions, and recommendation from Selected Engine Disassembly and Inspection Reports

J34WE36: Engine removed due to a cracked compressor case. Disassembly and inspection revealed the compressor outlet housing was cracked.

It was concluded that during installation of the cabin pressurization adapter, a long screw was used in error resulting in cracking insert 19H430-4, with crack extending past the boss approximately 2½ inches.

It is recommended that maintenance activities exercise extreme caution to use only the proper screw AN 502-10-8 when installing the cabin pressurization adapter.

J48-P-8: Engine was returned to overhaul for inducer replacement. Engine lubrication system was found to hold a mixture of 1010 and 7808 oil. Engine Bul. 233 had been previously incorporated.

It was concluded that the engine had been unknowingly serviced and operated with 1010 oil.

It is recommended that all activities concerned with operating the J48 engine insure that proper markings and warning decals are evident upon incorporation of Engine Bul. 233. (Item 2 of Part I under detailed instruction of Engine Bul. 233 refers).

J57P-16: Engine was removed due to metal contamination. Disassembly revealed the turbine front bearing Part No. 261123 had failed. The No. 5 bearing oil pressure tube Part No. 314953 was bent and distorted on the forward end. The oil pressure tube adapter Part No. 274206 was moderately gouged at the pressure tube mating port.

It was concluded that the bearing failed from oil starvation as a result of failure to install the pressure tube in the mating port of the adapter during reinstallation of the bearing support. Bending of the oil pressure tube resulted due to improper installation after compliance with Engine Bulletin 385 at jet repair shop.

It is recommended that particular attention be given to proper insertion of the oil pressure tube in the adapter at reinstallation of the number five bearing support.

Note: An identical failure also received involving a J57-P-8 engine returned to overhaul for high time. Parts involved (a) bearing Parts No. 261123, (b) oil pressure tube 266837, (c) oil pressure tube adapter Part No. 225231.

R3350-26WC: Engine removed and returned to overhaul for metal contamination The upper ring land of the No. 4 piston was burned away adjacent to the exhaust valve relief pocket. The four compression rings in this cylinder were broken and the dome collapsed on the exhaust valve. The cylinder head was burned from the rear spark plug insert to the exhaust valve seat.

Failure of the piston land, compression rings, exhaust valve and cylinder head was due to detonation and the resultant high cylinder head temperatures and pressures. The exact cause of detonation was not determined at overhaul. This type failure can result from defective or broken spark plug ceramic.

It is recommended that in the event of a known or suspected cylinder, piston or piston ring discrepancy, the spark plug be returned to the overhaul activity either with the cylinder or properly identified and attached to the engine.

R3350-26WC: Engine was removed and returned to overhaul for oil contamination. The front balance weight bearing failed and seized to the bearing journal of the front balance weight gear. The gear teeth of the front balance weight and the front balance weight intermediate gear were broken and/or crushed. The intermediate gear was broken in the web area of the larger gear. The front balance weight bearing oil end seal was severely scored.

The balance weight gear train failure in this engine was caused by excessive stresses created by the failure of the front balance weight bearing and its seizure to the front balance weight gear. The cause of the balance weight bearing failure in this model engine is believed to be a design problem and lack of adequate lubrication. It is known that this type failure can result from momentary oil starvation during certain aircraft maneuvers. This type bearing failure is undergoing further investigation to determine the cause and to provide corrective action.

It is recommended that, in the event of known or suspected balance weight failures in this model engine, all available data regarding operating conditions and engine performance from time of last overhaul to the time of failure be furnished to the overhaul personnel conducting the investigation. In addition, as soon as the information is available, the engine manufacturer should advise all concerned personnel regarding the evaluation results concerning the failed balance weight bearings that are submitted for examination. ●

MURPHY'S LAW*

Ordnance Murphy

The A4D-2 pilot was on a scheduled high-altitude dive bombing hop. After properly setting his ordnance switches, he commenced his first dive. At release altitude he pickled off and felt an unusually severe jolt from his starboard rack. This was the ejection cartridge firing. The target notified the pilot that he had dropped a bomb rack instead of a Mark 76 bomb. The pilot again checked his switches and found them to be properly set. The bomb rack fell within the target area.

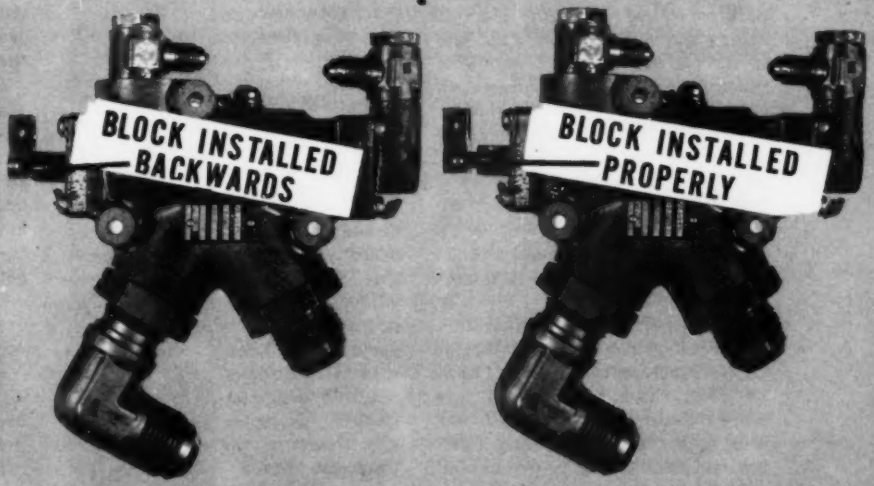
Cause of rack ejection was due to inadvertent reversal by ordnancemen of two bomb-rack cannon plugs; one plug completing the bomb release circuit, and the other plug completing the ejector circuit. Upon the pilot pressing the bomb release button the rack was ejected rather than a bomb being dropped.

Due to the similarity of the two cannon plugs, the possibility of the connections being reversed exists. The ejector cannon plug and receptacle have, therefore, both been painted red on all aircraft and bomb racks to prevent further similar incidents.

ComNavAirLant A4D Aircraft Technical Bulletin, states "To preclude further loss of bomb rack adapters due to inadvertent ejection, it is directed that for identification purposes that the ejector cannon plug and its receptacle be painted red."

S2F Murphy

Sluggish landing gear retraction in S2F model aircraft was determined to be caused by the bleeding-off of hydraulic pressure due to a partially-opened Emergency Dump Valve (Fig. 2-30, page 186 of HMI AN-01-855AA-2). This connecting link for the Manual Reset Button can be installed in either of two ways—one incorrectly and one correctly. Photo at left shows connecting line with offcenter block connected in such a fashion as to prevent the emergency dump valve from seating. Photo at right shows the off-center block providing clearance for the Manual Reset Button to fully close the emergency dump valve poppet. Inspection of squadron aircraft revealed three aircraft with this discrepancy. The reporting unit recommended a modification using a centered connecting hole which will permit sufficient poppet travel and preclude incorrect installation.—*Contributed by VS-30.*



*If an aircraft part can be installed incorrectly, someone will install it that way!

CLIPBOARD

Did You Know

THAT when shooting a low approach, even though the Omni is not in use, and not turned ON, it can be utilized to good advantage by setting the runway heading in the course selector window? From there on, the relative heading indicator (nose needle) will immediately give the pilot a visual reference as to the aircraft heading in relation to the runway desired. Even a low visibility approach can be performed without the mental hazards of having to compute the relative headings. The utilization of this handy little gadget affords you that extra time to concentrate on maintaining contact, at a critically low altitude, when the chips are down.—*VR-1*

Turbine Blade Failure

THERE are several internal failures which can occur in a jet engine and cause vibration but one of the easiest to spot is that of a failed blade. Assuming this isn't one of the fairly rare times when progressive failure of all the blades is involved, the symptoms are normally these:

A slight explosion and vibration.

A slight rise in EGT.

Usually no fire warning light.

All other instruments read normal.

No smoke, change in fuel-flow, loss of oil pressure or variation of RPM. *Corrective Action:* Throttle slowly back to minimum safe flight power *very slowly* and proceed to the nearest landing facility and land using a precautionary flameout approach. *Do not* make abrupt changes in power such as caused by shifting to manual fuel control. This will only aggravate the condition.

In nearly every case the mill will hold together until you get down if you follow the above procedure since a progressive failure through the rest of the stages will usually occur immediately upon failure of the first blade if it is going to happen at all.

Needless to say that if the buckets go out completely with the first explosion—get out and walk—you have earned that day's flight pay.

—*1st MAW Wingtips*

First Sight

Situation: At 1118R, 771st AC&W Squadron alerted the Norfolk DF-Radar Net reporting bailout from A4D type aircraft in the vicinity of Tangier Island, Va. Helicopters dispatched from Oceana, Patuxent, and Langley. Coast Guard surface craft got underway to assist. Wingman of A4D orbited the scene.

Results: At 1152R, helicopter from NAS Patuxent River recovered pilot from his liferaft in good condition. Aircraft wreckage located by Coast Guard surface craft in position 37-54-23N 76-02-40W.

Comments: Excellent work and cooperation from the helicopter made this case routine. In addition, the wingman's proper use of distress procedures in getting the word out, got the helicopter to the scene in near record time. One comment should be made on the recall of the Langley helicopter which was actually closer to the pilot than the Patuxent River helicopter. The position first reported, indicated the pilot was down in a position nearer to Patuxent than was actually the case. Consideration should be given to the policy of *letting all rescue craft proceed toward the scene until the survivors have actually been sighted by one of the rescue craft.* —*Norfolk Search*

Stores Loss Thru Personnel Error

WE ARE all familiar with the old saw "stray voltage" as related to inadvertent release of external stores. In fact, this is rapidly becoming as expedient to use as the much belabored "pilot error." *But is it really true???*

The numbers of inadvertent releases, on the ground as well as in the air, by mechanic as well as aircrewmember, leave some doubts as to the validity of this "stray voltage" cause factor. Mainly because subsequent continuity and system operational checks demonstrate that the system operates as designed. What, then, could be the cause?

Have you tried personnel error? Was the preflight of the system completed in line with existing directives. Were the pertinent switches properly positioned at the time of inadvertent release? If not, who malpositioned them? Were the operating and maintenance personnel aware of exactly what ordnance was aboard? Were the proper form entries complete and accurate?

Each of these items, plus many, many more are solid possibilities. Make sure that YOU investigate thoroughly in each instance. The life you may save may be your wingman's.—*USAF DFSR "Investigation Tips"* ●

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all
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approach

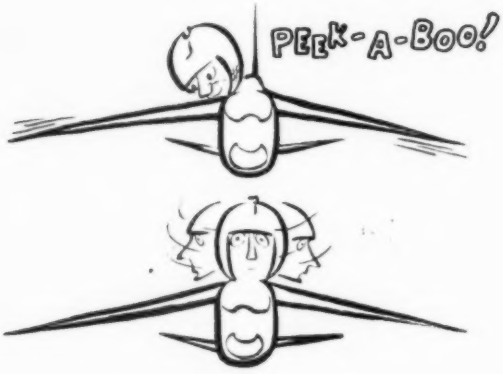
Pass the Word

Not too long ago a pilot ejected and we lost a perfectly good million dollar F4D just because the battery-generator switch was inadvertently flipped to OFF when the pilot raised the arresting hook control lever after dropping a tow banner and cable. Check it yourself and see how easy it is to backhand that battery-generator switch. Unfortunately this was the first time the possibility of such inadvertent activation of that switch had come to the attention of the squadron.

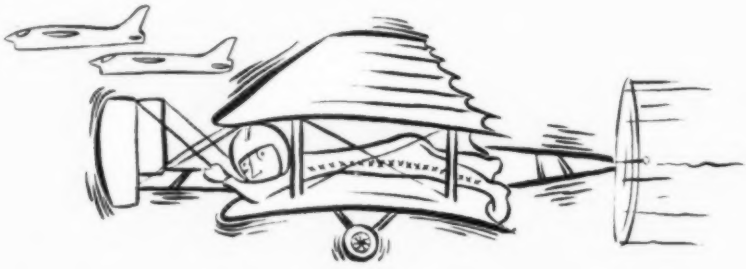
In the resulting investigation the AAR Board discovered that this problem had been encountered in other squadrons, one of which was in the *same* air group. However no one thought to pass the word. The Board very rightly considered "failure to pass the word" a contributing cause of the accident and noted: "This illustrates the necessity for any organization that becomes aware of a potentially dangerous situation to make this fact known so that squadrons operating the same type of aircraft may profit by their experience." Had the pilot been so forewarned, it was the opinion of the Board, the accident might well have been prevented.

A GOOD FORMATION FLYER

joins up short and then eases in...



never loses sight of his teammates



and remembers his limitations!

Adapted from CNAVanTra "Flight Safety Bulletin."